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THE
AMERICAN ALPINE JOURNAL

VOLUME IV 1940 NUMBER 1

An Attempt on Mt. Wood, St. Elias Range

FORESTA HODGSON WOOD

PERMISSION for the Third Wood Yukon Expedition having been granted by the Canadian authorities, we set out on June 27th for Seattle, Skagway and Whitehorse. Walter Wood, Anderson Bakewell, Roger Drury and myself made up the personnel. We hoped to complete a program, begun in 1935, of perfecting field techniques of a method of mapping wilderness areas by means of high-oblique aerial photographs, which has been developed at the American Geographical Society during the last nine years.

The weather is the greatest unknown factor in this southwestern section of the Yukon Territory. We were supplied with carefully considered equipment and properly computed food values for two months in the rugged mountainous country; but the weather was out of our hands. No way of supplying ourselves with the desirable number of fine days for the photographic survey. However, we had plenty of optimism.

From Whitehorse we flew 150 miles N. W. to Burwash Landing, a trading post on Kluane Lake. It was here that the Jacquot Brothers outfitted us with horses for the first reconnaissance into the heart of this section of the St. Elias Range in 1935. Several days of checking equipment, sorting and repacking supplies followed, and on July 15th we were off with a pack-train of thirty horses. Two days across high, swampy tundra, then down into the broad flood plain of the Donjek River which carries the swift water of uncounted glaciers. This river of ever-shifting channels must be crossed in the early morning before the sun melts the snow and ice above, causing the waters to rise too high to make a

CAMP AT 7200 FT. ON MT. WOOD

Photo F. H. Wood

crossing safe, or even possible. Then up the boulder-strewn moraine of the true right bank of Wolf Creek Glacier for two days, where we found traces of the trail and most of the cairns we had made in 1935.

At our first camp above timber-line, the main pack-train left us with orders to return two months later. We kept with us three horses and one Indian, Sammy, to help relay our stuff forward to our eventual Base Camp over the increasing upheaval of moraine and boulder slopes and through the many turbulent tributary streams, rumbling with unseen boulders, which crossed our way. Near one of these streams we came across the sad rock-chewed remains of a rucksack and a suit of huge long woolen underwear. Knowing that, besides ourselves, Bradford Washburn and Robert Bates were the only living beings able to make use of long woolies to have passed this place, we came to the conclusion that they had discarded them on their long trek out after their climb of Mt. Lucania in 1937. Ten days after leaving Kluane Lake we were established at our Base Camp at the bend of the glacier, at an altitude of 550 ft., with Mt. Steele[1] strikingly beautiful to the S. and and Mt. Wood, massive and majestic, the same distance W. across the glacier.

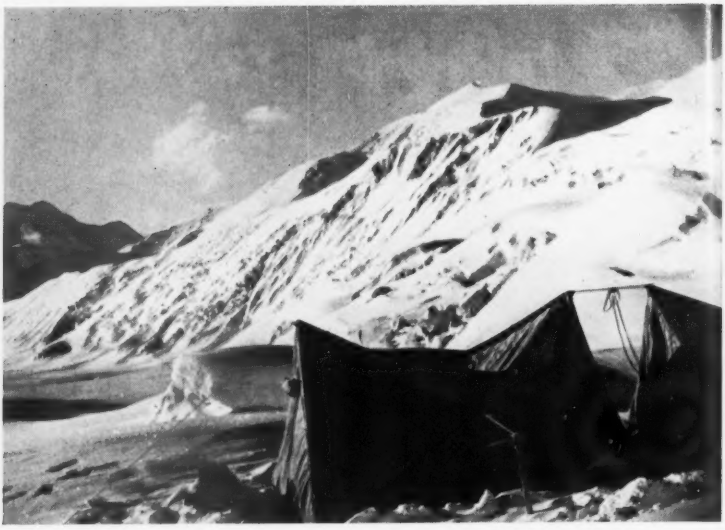
Careful reconnoitering proved the great stagnant glacier with its rubble, icefalls, and crevasses impossible for horses, and on July 25th we said good-bye to Sammy, the competent Indian, and the last of the horses. We also said good-bye to good weather, although we were happily unaware of this, for the next day the first snow fell in Base Camp, a month earlier than it had done in 1935. A week of arduous back-packing more than a ton of supplies across the glacier followed. Advance Base Camp (ABC) was established at 5700 ft. in the valley on the far side and, on August 2nd was occupied by the entire party.

Mt. Wood, rising to 15,880 ft. eleven miles to the W., was the objective for high photographic ground survey stations to link up the groundwork of the previous expeditions. The mountaineering impulse in each of us quickened with the nearness of the mountain. Spirits were high, but the barometer was low. Sure that it would soon rise, we decided to start establishing camps on the mountain

[1] "Ascent of Mt. Steele." *A. A. J.*, ii, 439.

MT. WOOD RISING OVER 10,000 FT. ABOVE WOLF CREEK GLACIER
Photo, F. H. Wood

BACKPACKING OVER LOST SOUL HILL, WOLF CREEK GLACIER
Photo, W. A. Wood, Jr.



CAMP III (10,300 FT.) ON MT. WOOD
Mt. Walsh (l.) and Mt. Steele (r.)

DESCENDING FROM RECONNAISSANCE ON MT. WOOD
Fore Peak (10,500 ft.) in foreground
Photo, W. A. Wood, Jr.

itself to be ready to take advantage of good weather when it came. The old optimism was still with us.

Familiarity with our photographs of the mountain taken on reconnaissance flights helped in deciding the route and the number and positions of necessary camps. During the next few days gopher-chewed tents were mended, wild mountain sheep (*Ovis Dalli*) were shot to supply us with fresh meat for the high camps, and when the clouds lifted and the sun shone for a few hours we were able to get a necessary survey station. The unpromising weather bothered us very little, for overcast days were fine for back-packing, and we made arrangements with light hearts and great dispatch to move toward the high places.

The way to Camp I led over soft tundra covering the lower talus slopes, more roaring glacier streams to be crossed in the early morning, past high blue glacial lakes edged with moss and flowers and set in the midst of desolate moraine. On over tiring rubble and rock and at last up a steep, high moraine to the vicinity of snow line. On August 8th, at 7200 ft., we found ourselves camped on rock beside a singing, silt-laden stream (undrinkable) with a broad glacier below and a glorious view of snow mountains all about us. The next day was a rare one with a good share of sun and Camp 2 was located about 2000 ft. above and stocked with food for a week. The next morning dawned beautifully celar and with heavy packs, including scientific equipment, we climbed the boulder-strewn moraine till it disappeared beneath the surface of the ice. On the highest rocks a survey station was established and a complete round of photographs taken. From this point on we were almost continually on snow. We roped to cross the now sun-softened, deeply snow covered glacier, sinking sometimes waist deep, never knowing how far the next step would let us down. Hidden crevasses, impossible to see due to the flat light, made progress slow, and the leader had the worst of it of course.

Camp 2 was finally reached in mid-afternoon and, as clouds came rolling in, we pitched our two small tents, facing each other as usual, on a rock platform. The rubble-covered ice slope on which we were situated rose steeply from the edge of the glacier for several hundred feet and was crowned by a great icefall above and to our right. Small stone falls rattled down from the jagged pinnacles above and we had a stream of ice water (drinkable) run-

ning conveniently between the tents. We went to sleep to the sound of stone falls, of melt water running under our rock platform, the occasional roar of séracs falling from the icefall of the upper glacier, and the soft plop of snow on the tent roof.

It lifted enough by 10 o'clock next morning to explore the route upward and to locate Camp 3 at 10,300 ft., on a small snow ledge 100 ft. above the catchment basin of the East Valiant Glacier,[2] with the lip of a crevasse on one hand and the knife-edge ridge of Mt. Wood rising abruptly on the other. A veritable Shangri-La we thought it, in a world of snow and ice. From here, given decent weather conditions we felt that the mountain could be climbed. Back at Camp 2 we went happily to sleep with dreams of an early start the next morning for the final relay to Camp 3. But the next day it snowed, and the next, and the next. On the fifth day retreat was in order for although there was food for a week at Camp 3, more was necessary at Camp 2 for safety's sake.

Down to ABC and a day and a half of what we called rest but which was, in reality, one continuous meal, after which, on the 17th, we started up again for Camp 1. Clouds were cascading over the Steele ridge but the barometer was rising slowly. The next morning a rose and flame sunrise awakened us at four and we were up and away by six. Snow conditions were a joy compared to the last trips; crevasses were well bridged, and we made Camp 2 by 9 A.M. Our site was well chosen, for avalanches had fallen to the right and left of our two little tents, but these were safe and dry. While we rested and had a small lunch the ominous portent of the night before was fulfilled. Snow began to fall, everything closed in and there was no hope of pushing on to Camp 3 that day as we had planned. At midnight a terrific wind hit our tent startling the sleeping camp into immediate watchfulness. It banged down on us from the mountain, and then, continuing to grow in force, perversely roared up from the valley and occasionally hit us broadside down the steep slope under which we were camped. The tiny tents strained and tugged furiously. It seemed impossible that they could stand against this wild unpredictable bombardment. Snow rattled on canvas and even sifted through the finely woven tent walls, covering the sleeping bags and I gathered my cameras

[2] Names used in this article are largely provisional and subject to ultimate acceptance by the Canadian authorities.

into mine to try to keep them dry. The great force of the gale died down after several hours and we slept in damp eiderdowns, exhausted.

The following day it stopped snowing about noon and the spirits soared again with the rising barometer. Tomorrow we would surely make Camp 3. On August 20th we were up at 4 A.M. rejoicing in a clear morning. Before the breaking of camp was accomplished, which took time due to ropes being frozen to anchor rocks and buried in ice and snow, high cirrus drifted in and the barometer fell a few hundredths as we started. Soon it was overcast, and we were thankful for the wands placed on the first trip to guide us, for it was hard work breaking trail through soft wet snow with seventy-lb. loads. After five hours, which should have been nearer two, we gained the base of the ridge and found our tent bone dry on the wind-swept surface. The view was shut away by mist and clouds and as we pitched our second tent the eternal snow began to fall. But we had reached this goal at last after ten days of weather watching, one complete retreat, snow-bound days and wind swept nights. Now let it blow but let the sun come out to settle the snow and we will take our chance when it comes!

Two more days and nights of snow and wind alterating and intermingling, both inside and out. Tent floors were pools of water by day and sheets of ice by night, and on the third day the sun rose, miraculously revealing range on range of snowy mountains in a great semi-circle, broken only by the pyramid of the Fore Peak to the E., the glacier below gleaming in the foreground and Mt. Steele clear cut against the sky. A reconnaissance of the ridge to the shoulder was in order. Step-cutting would thus be accomplished and the first quarter of the climb to the summit would be made easier and therefore quicker. Today's sun would have time to settle the new snow and we would get photographs that could not be taken on an earlier start. Thus we reasoned; and we prayed for the weather to hold.

A two and a half hour climb brought us up the corniced ridge above camp, a 50°-60° grade in places; over a deep gaping schrund and onto the shoulder about 1500 ft. above camp, where deeply drifted snow covering an icefield made progress exceedingly slow. From this point the route to the summit was studied. From time to time the top of Mt. Wood showed golden through the clouds en-

couraging us; but the questionable snow conditions and the uncertainty of the weather made it seem wiser to save ourselves for the morrow when the snow should have settled somewhat and the steps already cut up the ridge would greatly shorten our time. Down to Camp 3 we went in high spirits where all preparations were made to climb the next day. At 3.30 that afternoon it began to snow again. All night it snowed, and for the next day and night the vigil we kept was unrewarded. We lived in a world of blank mist, cold, and snow which all but covered the tents, until the evening of third day, when with one more day's food to go, we cheered the sun; and that night a half moon rode high and clear over the summit of Mt. Steele. That night was the coldest we had, 10° F. at 6 A.M.

The next morning brought the perfect cloudless sunrise we had waited for so long. We scraped the snow from the buried rope and crampons, and though Walter was not too hopeful of the snow conditions, it was up today or down to ABC for more supplies. At 6.45 A.M. we started up with Walter saying, "We go only so far as snow conditions will let us in safety." The cornice on the ridge had completely reversed itself. It now overhung to the S. W., having been formed by a northerly wind, and was far bigger. All our carefully made steps had vanished and the new cornice had to be swept away and the possibility of avalanche weighed.

A gruelling few hours of alternating hope and doubt brought us at last to our cache of willow wands, left on our reconnaissance climb and now buried in twelve inches more of new snow. Here boots were removed and numb toes massaged to ward off threatened frostbite. After a meal of sausage, cheese, chocolate and a few dates, we roused ourselves and started off again across the plateau toward a steeper ascent. Because of the deep snow, Walter abandoned his first route which lay up the face between two icefalls and took a curving, uphill route to the S. W. Leaving the icefall on our right we traversed a steep wind-blown slope, on the alert for avalanches, to the base of the most easterly of three black rocks, the highest and, I think, the only exposed rock on this face of the mountain. Here the snow was feathery deep and insecure around the rock. After several attempts on the rock face, Walter selected the ridge itself and, with rarely a handhold, gained a tiny spur above us where he was secure. Two hours later we had all negotiated the

MT. WOOD RISING FROM SEA OF CLOUD AT 11,500 FT.
Photo, W. A. Wood, Jr.

UPPER 6000 FT. OF MT. STEELE

Large scar in face at right has developed since 1935

Photo, W. A. Wood, Jr.

LOOKING DOWN THE DONJEK GLACIER FROM 17,000 FT.
About 25 miles of glacier appears in the picture
Photo, W. A. Wood, Jr.

MAZE OF UNCLIMBED PEAKS, ALL EXCEEDING 10,000 FT. IN WOLF CREEK RANGE, SEEN FROM 18,000 FT.

Photo, W. A. Wood, Jr.

rocks and the feathery ridge which rose steeply to another high plateau.

During this time, shortly after noon, a breeze had sprung from somewhere and gradually freshened, ruffling and blowing the snow. At 1.30 we stopped for another lunch and more rubbing of fingers and toes, and here, at about 13,000 ft., we decided to abandon the crampons. Walter estimated that it might be another five or six hours to the summit, the snow being as it was, which would get us there about 6 P.M., several hours later than we had hoped. But the downhill would be nothing by comparison; we would be in camp by midnight, and the nights were not yet very dark here near the arctic, and besides there was a moon.

The snow surface was difficult to read and with the drift and crust alternating interminably, the lead changed every half-hour. At about 13,500 ft. we had a magnificent panorama starting with Mt. Lucania to the S., the ridge to Mt. Steele; Mt. Hubbard, 75 miles away; Mt. Walsh and finally the peaks of the Wolf Creek Range flattened and dwarfed below us. In the distance Kluane Lake, and to the N. E. the ice-free country merging into the Yukon plateau.

Up and up, ice-axes creaking in the snow, mittens stiffened with ice, the sky above the summit a brilliant darkening blue; and then we noticed the snow beginning to plume away from the top of the mountain. The wind had gradually increased in velocity and soon we were bending our heads into the gale. The sky was dark with blowing snow. Our route from here lay in shadow and without the sun the cold was intense. Walter called a halt, for he remembered this wind from the Mt. Steele climb, and against it we would not be able to stand on the summit and therefore no survey station would be possible. We risked frozen feet and the force of the wind was slowing us dangerously. The snow was now streaming out a mile from the summit ridge above—at least a 70-mile gale. And so, at a little before 4 P.M. with about 1800 ft. to the summit, we turned our backs on the mountains. On a high shoulder, where the driving wind had already obliterated our tracks, we established our photographic survey station.

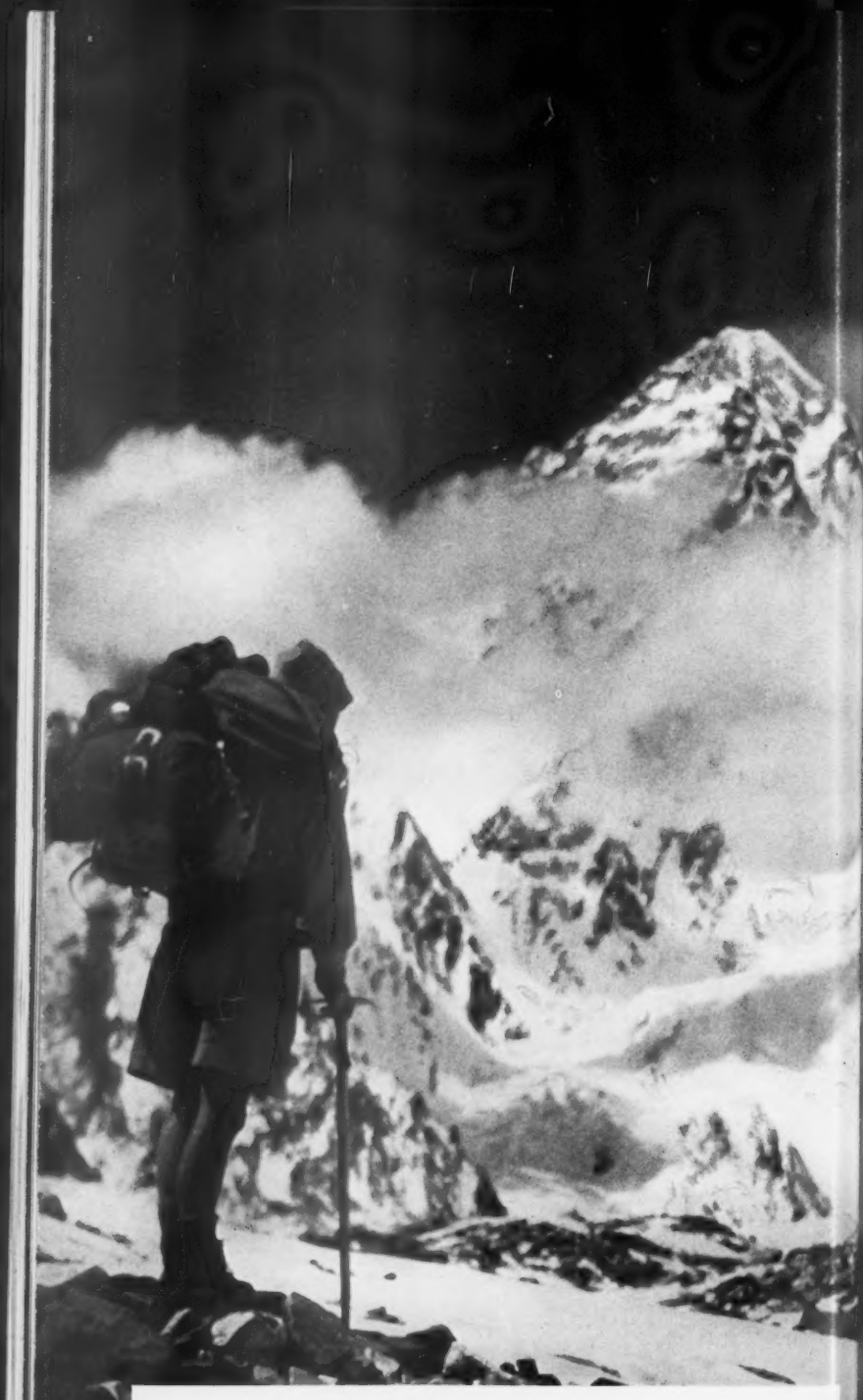
Six-thirty that evening found us drinking hot tea and rum in our small tents and the clouds were rolling in below and all about

us. Oh well, "He who climbs and comes away will live to climb another day," quoted someone cheerily, and we all felt better.

The weather really never gave us a break during our whole 60 days in the field, although by biding our time and watching for clouds to lift, we were able to get all the necessary survey stations. In retrospect and on consulting Roger's meteorological record, we found that we had been blessed by only four fine days, "fine" meaning better than 70% clear all day. On the 15th of September, in a truly fine blizzard, we left Base Camp for the trek down to the Donjek and over the tundra to Burwash; but all the clouds and mist and snow could not dampen our hopes for an early return to this valley and to these mountains.

MT. WALSH (14,900 FT.) FROM THE W.

Photo, W. A. Wood, Jr.



FIRST VIEW OF K2

Photo, G. C. Sheldon

The Second American Expedition to K2

CHAPPEL CRANMER and FRITZ WIESSNER

1. The Journey to Basecamp

WHEN permission for an American Alpine Club attempt on K2 was granted in December, 1938, the mountain seemed impossibly far away for us to reach by summer. Although our way had been well paved by last year's party which had reconnoitered the various ridges of the mountain and had accomplished an excellent feat in reaching 26,000 ft. on the Abruzzi Ridge, we had a difficult job ahead of us even to equal their record.

The Indian government is reluctant to grant permission to large parties, which seriously disrupt this poor and barren country economically, and because the small, mobile party had proved itself fully as capable of success as the large; it was determined that the 1939 expedition should be only slightly larger and more elaborately equipped than last year's. Early in March, Fritz Wiessner, sailed for Europe to join Dudley Wolfe and collect what equipment we had bought over there; and a week later Eaton Cromwell, George Sheldon and I sailed with the rest of the equipment. When two days at sea we received the news that Jack Durrance would meet us in Italy; thus our party of six was complete.

On April 14th, six hot and dusty travellers got off the Frontier Mail in Rawalpindi where our capable agent, Major Lander, advised us to send as much of our equipment as we could ahead of us to Karghil in bond; so we spent one full day putting together our plywood boxes and packing them and our dufflebags. The following day we motored through the gorge of the Jhelum River into the Vale of Kashmir and arrived in Srinagar in time for tea at the home of Major Hadow to whom we are deeply indebted for assistance in a multitude of ways.

We were to have ten days of skiing, Wiessner having suggested this interlude as a means of acclimatization before starting the long trek to the mountain. We were given the privilege of using the Ski Club of India's Khillanmarg Hut (10,000 ft.), overlooking the Vale, where the skiing was on perfect spring snow and we had

magnificent views of the main range of the Himalayas. When we returned, our nine Sherpas had arrived headed by last year's leader, Pasang Kikuli, and including three others who were with the 1938 expedition. Also, Lieut. G. S. C. Trench, R. A., had joined the party as transport officer. On the 2nd of May we said goodbye to Srinagar and Major Hadow's boundless hospitality.

We travelled up the Sind Valley on the ancient road to China. Our second night out we pitched our tents on snow at the edge of the village on Sonamarg, whence a short day of snow walking brought us to the foot of the Zoji La, lowest of the great passes over the Himalayas though over 11,000 ft. Owing to the difficulty of crossing the pass with ponies at such an early date, we had arranged with the government contractor to use coolie transport as far as Dras, and leaving at 1 A.M., we were soon ahead of our heavily laden coolies and climbing slowly up the steep slope of hard snow between dark and towering cliffs. It was three by the time we had reached the top of the pass where we passed a few rough-looking Ladakhis travelling toward Kashmir but it was too early in the season to pass many travellers. We crossed a number of old avalanche tracks before the valley broadened out. Magnificent snow peaks towered all around us, glittering in the moonlight. Ahead lay barren and rugged Baltistan, magnificent but forbidding and a home only to those hardy Baltis who have scraped a living from earth where nothing grew before. The last of the party arrived at the Metayan resthouse by nine o'clock. It had been a tiring march but an unforgetably beautiful one.

One more snow walk brought us to Dras where we paid off our coolies and hired horses. From here to Dassu we used as much horse transport as was available. Wiessner and Trench made a long double stage to Karghil to get the loads which we had sent ahead and to arrange with the Tehsildar for transport to Skardu. Meanwhile we did the two regular stages to a barren campground at Kharal Bridge where we crossed the Dras River. The next day we continued down the river and after a hot and dusty walk which ended with an 800-ft. climb, we sat enraptured in our orchard campground as apricot blossom petals rained down upon us and floated in our teacups. This steeply terraced village of pink blossoms and green fields seemed a fairyland of spring only possible in a poet's imagination. Late in the afternoon, Wiessner and Trench rejoined

us. They had brought the rest of our loads and a Chuprassi (native policeman) whom the Tehsildar had sent to help us with our transport. We now had ahead of us five hot and dusty marches down the Indus Valley to Skardu. We passed though a number of villages but saw no more blossoms for we had descended to a lower altitude and summer weather. A few miles from Skardu, the valley broadened and we had glimpses of high peaks in the direction of the Karakoram, and one we thought might be Masherbrum. Late in the afternoon of the day we arrived in Skardu, the Wazir and Tehsildar called on us along with all the other notable residents of the capital of Baltistan. After lengthy discussion, coolie rates to Basecamp were at last arranged. We were to have another Chuprassi to assist us as far as Askole, the last village, and about twenty-five local coolies were to accompany us to give competition to the Askole men. The following day we crossed the Indus on a big barge which was carried across by the current and some encouragement from the noisy crew. Three more days brought us to the end of the horse trail and the bank of the Braldo River. All blisters were pretty well healed by this time for no more riding was possible. Crossing the river on a zakh, or skin raft, a more seaworthy craft than it looked, we arrived in the little village of Dassu on May 17th and enjoyed our first rest day since leaving Srinagar.

The Braldo Valley between Dassu and Askole is narrow and precipitous; the scenery, the wildest imaginable. The trail led up over huge bluffs and at times followed along the rushing, muddy torrent of the Braldo. These stages brought us to the remote but comparatively prosperous village of Askole, the last we were to see until our return at the end of the summer. All afternoon the coolies argued and shouted about the rates and seemed to have the intention of striking for higher pay, and though the Askole men were very much disturbed at our having brought Skardu men with us, they finally agreed to the rates set by the Tehsildar, and we were ready to make the last few marches to the mountain.

One day from Askole, one of our Sherpas, Pemba Kitar, arrived in camp so ill that we could not take him further. The other Sherpas discussed the matter, and it was finally decide to send him back to Skardu until the doctor there would permit him to come. The following day we had to wade the icy Panman River and continued up the Braldo under threatening skies. It rained the next

morning but not for long and the coolies continued willingly and we had our first view of the Baltoro Glacier. Two days of unpleasant walking on the snow and débris covered glacier brought us to Urdukass, the last camp where there was any wood at all. The weather became steadily worse; the following day it snowed; and the coolies were unwilling to continue. This worried us for we had only enough tsampa (roasted barley flour) to keep the coolies for three extra days. If the bad weather lasted longer, they would have to be sent back to Askole and we would lose many precious days for obviously it was impossible to take our hundred loads the three remaining stages ourselves. However, the weather improved, and though the coolies struck for higher pay, they finally changed their minds and there was no change in the rates. We paid off nineteen and the next night camped among the ice ships in the middle of the Baltoro, surrounded by the giants of the Karakorams. As the sun set behind the spires of the lower Baltoro, it cast its last rays on the summits of Masherbrum and Gasherbrum IV. These last three days of the trek we saw some of the world's most magnificent mountain scenery. The Mustagh Tower, Bride Peak, Golden Throne, Mitre and the others kept us enraptured the whole day through.

At last, on May 31st, we turned the corner onto the Godwin-Austen Glacier and beheld K2. It was a tired but happy party that slept at Basecamp that night. We were at 16,600 ft., at the foot of our mountain and eager to try our strength on it.

C. C.

2. The Attack

Arrived at Basecamp, our party consisted of Eaton Cromwell, Dudley Wolfe, George Sheldon, Chappel Cranmer, Jack Durrance, Lt. Trench, R. A. (transport officer), myself, 2 Sherpas, 2 Baltis, 1 Hindu and a cook.

In view of the difficulties experienced by the 1938 party on the Southeast or Abruzzi Ridge of K2, we desired to examine the possibilities of other routes. Vittorio Sella had recommended a study of the N. E. ridge. On June 1st, Cromwell and Pasang Kikuli accompanied me from Basecamp on a reconnaissance up the Baltoro Glacier, and camped at noon opposite the Abruzzi ridge, ascending half way up the peak opposite K2 the next day. With this view we

ENTERING ICEFALL ON WAY TO CAMP I

Photo, J. Durrance

PARTY DESCENDING AT CAMP IV (21,500 FT.)

Photo, D. F. Wolfe

BROAD PEAK AND BRIDE PEAK FROM CAMP IV

Photo, F. H. Wiessner

PASANG KIKULI NEAR CAMP V

Photo, D. F. Wolfe

were convinced that the Abruzzi ridge was the better, especially as the N. E. ridge is exposed to the prevailing W. and S. winds. From this point of vantage, we also decided to try to eliminate Camp III (of the 1938 party) due to gangers of rockfall at that location and, returning to Basecamp, we followed a shorter route through a badly broken icefall. (Camp numerology of the 1938 party is followed throughout.)

On our return to Basecamp we found Chappel Cranmer ill with cardiac decompensation. Durrance, with untiring efforts nursed him through the crisis, and six weeks later Cranmer was able with some difficulty to visit Camp I.

With the help of the Sherpas and the two Balti porters, we started packing up to Camp I; we were pleased at the success of the Baltis, although the Sherpas clearly preferred to have the monopoly of such work; eventually, then, we paid off the Baltis. Another member of the party, Chandra Pandit, a Hindu from Canon Briscoe's School in Srinagar, taken along at Major Hadow's suggestion, was most helpful in our organization.

On June 9th, Jack Durrance, Pasang Kikuli and I set out to find a new, higher, campsite for Camp II, thus to eliminate old Camp III. Taking the first snow couloir W. of Camp I, we gained nothing. The next day most of us climbed over the 1938 route and passing the site of Camp II, established a cache 500 ft. higher when we could not find another campsite. On the 14th, Camp II was established on the 1938 location. On June 17th, after a snowstorm, Cromwell, Durrance and the Sherpas continued above Camp II. The steep, snow-covered rocks made it impossible for them to reach Camp IV as they had planned, so they returned to Camp II. In the following days Sheldon, Wolfe, the Sherpas and I pushed through to Camp III, establishing other caches. Durrance was handicapped by poor boots (his expedition boots not yet having come) in addition to nursing Cranmer, so he could not yet go higher. Using the site of old Camp III as a cache only, we could now proceed right through from Camp II to Camp IV. On June 21st, Durrance (with his new boots), Sheldon, Wolfe, five Sherpas and I started for Camp IV, along the route well described in the American Alpine Journal for 1939 by House, which is less complicated than below Camp II, but exposed to some stonefalls.

The higher one proceeds on the Abruzzi ridge the more broken it becomes, reminding one of the Peuteret Ridge on Mt. Blanc. We found quantities of rope left by the 1938 party, but much of it had to be replaced.

We hoped to eliminate Camp V, as the distance from Camp IV to Camp VI is relatively short; at this point, while at Camp IV, terrific storms came up, and threatened destruction of our tents, sounding like veritable machine-guns, as the gusts struck the tents.

To describe these days and nights of storm and cold is not within my power. They were terror-inspiring. Finally, on June 25th, came the first break, when three Sherpas arrived from Camp II with a worried note from Durrance. On the 29th, the weather seemed clear, and Sheldon with three Sherpas descended to Camp II, while Wolfe, Pasang Kikuli, and myself started for the House Chimney and Camp V. We found the old ropes buried in the deep snow in the Chimney and the first day we only partly cleared the rocks. The second day, Pasang and I reached the top of the Chimney after two hours work, and I can only commend House for his ability in having originally led up this piece of difficult rock climbing. Camp V was then established on the old platform by Wolfe, Pasang and myself. Two days of storm followed.

On July 5th, with 40-lb.-loads, Pasang Kikuli, Tendrup and I started for Camp VI. From Camp VI we could see Nanga Parbat, 120 miles away to the W., where I had been seven years before, and I hoped for a repetition of that year's beautiful July weather. From Camp VI to Camp VII we found but little of last year's ropes, and the going over the rocks was slow for six hours. Then a 300-ft. ice traverse, to the site of Camp VII, whence we returned temporarily to Camp VI. Here we weathered another storm, and on July 8th descended to Camps V and IV. In the meantime, since June 21st, Cromwell, Durrance and Lt. Trench had made five relays between Camps I and II, and another to the cache at Camp III. Sheldon had been forced down to Basecamp by frost-bitten toes. Meanwhile word had been sent out to Askole for coolies to be back at Basecamp on July 23rd, it having been agreed that Wolfe and myself, with some of the Sherpas, could stay on the mountain for somewhat longer, as we had ample provisions, the party being, meanwhile, divided into two groups—Durrance, Wolfe and myself on high, Cromwell and Trench at Camp IV or lower, ready to go out

with Sheldon and Cranmer on July 24th, even if we were still up on the mountain.

With Camps I to VII thus all well stocked, Wolfe, Durrance and I with two Sherpas moved up again; on July 12th, going beyond Camp VI, Durrance had great difficulty in breathing. Two hundred yards beyond Camp VI he wanted to return to Camp VI, the rocks being well fixed with ropes, it was altogether reasonable for him to return alone to Camp VI, which he did. Later data shows that Durrance was unable to recover at Camp VI, and soon thereafter descended, leaving no Sahib above Camp IV. However, as Cromwell and Trench were unable to remain as high as Camp IV, there was, in fact, unknown to us above, no Sahib above Camp II. At Camp VII the mountain seemed more friendly towards Wolfe and myself, much of the new snow having disappeared in eight days, and our Sherpas were doing wonderful work.

Camp VII was now well established with eleven loads of supplies. Wolfe, Tendrup, Pasang Kitar, Pasang Lama, and I left films, camera, two tents, two stoves, six quarts of fuel, three sleeping-bags, and twelve days' food at Camp VII, and started on the 14th for Camp VIII over snowfields to the right of the shoulder ridge. In 5½ hours we made camp, while Tendrup and Kitar returned to Camp VII, to bring more food and two more sleeping-bags the next day. All three of us were in fine condition, Wolfe doing actually better the higher we went, to my delight.

For the next two days, light snow, but not bad like the June storms; and July 17th dawned clear. Staircase Peak to the E. was already below us, and behind Windy Gap we could see the Shaksgam Valley and the high snow summits of Turkestan. Broad Peak was still above us to the E. We left camp around 9 A.M. with one tent, sleeping-bags, and fuel for seven days. The snow was soft and very deep. Sinking to our hips, the last 20 ft. up to the bergschrund seemed impossible. That took two hours! Exhausting was no word for it, but I finally crossed it, with Pasang Lama belaying me. Wolfe, weighing more, found the going even harder; trying again and again, he finally gave up, and returned to Camp VIII, a short distance below, amply stocked with food and fuel and stove. He had his sleeping-bag with him. He might follow us the next day with Tendrup and Kitar if the snow settled, otherwise he would await the return of Lama and myself at Camp VIII. Crossing the

slope to the shoulder of the S. E. ridge, we made camp, a short day's advance, but a strenuous one. On July 17th we moved camp to the foot of the rock ridge, crossing a place where numerous ice blocks had fallen. This was Camp IX, 26,050 ft. The following day, in fine weather, Lama and I started for the summit. Up over two difficult pieces 500 ft. above Camp IX on the S. E. ridge, we reached the steep reddish wall of a large buttress, 800 ft. higher. Here two routes presented themselves. We could traverse to the E. into a snow gully which headed up under the great ice cliff, the other to the W. of the buttress across steep black rock. Although the ice cliff appeared to be in good condition, we selected the route to the W. of the buttress, in spite of a difficult overhang near its end. Thence over a pronounced ridge onto difficult rotten rock, always working upwards, into a snow couloir cutting in behind the buttress. Eighty feet short of the head of this couloir against the S. ridge was an overhang. There was an escape from this couloir to the W., which I had noted below: a traverse of its steep westerly wall, which would lead to a little snowfield running up towards the S. ridge. This traverse was about 50 ft. in length, but Pasang Lama refused to proceed; the time was 6.30 P.M., and he preferred to go back to Camp IX, and tackle the summit the next day by the ice gully E. of the buttress. I had been counting for an hour on an all-night climb, as we were both in excellent condition, the weather safe, and the nights light at that altitude. From this point on, the going was clearly much easier and there would be many resting places along the S. ridge, where we could sit. To return now meant we would be forced to negotiate the very difficult rocks and the overhang by night. As Pasang Lama continued to insist on descending, I yielded—he had been a wonderful companion—and there was a good chance that we would find easier going tomorrow in the gully. Later on, I found that Pasang Lama had not at the time realized that our difficulties were to end with the 50-ft. traverse, which we faced—from where he stood he could not see that—and he had not examined the terrain from lower down.

The overhang we descended with a long rappel; Pasang Lama's rope tangled in his crampons, strapped to his back; unstrapping them, he lost them. We reached Camp IX at 2.30 A.M. and many times during that descent I regretted intensely that I had not insisted on continuing over that last short traverse.

VIEW OF GODWIN-AUSTEN GLACIER FROM CAMP VI

CAMP VI

Photos, F. H. Wiessner

SUMMIT OF K2 (28,250 FT.) SHOWING ROUTE ABOVE CAMP VIII (25,300 FT.)
Highest camp was at extreme left where track makes acute angle. Highest point reached 27,500 ft.

Photo, F. H. Wiessner

The next day, lovely and warm, we stayed in camp, and I lay luxuriously, stripped, on top of my sleeping-bag in the wide open tent. Our highest point the previous day had been about 27,500 ft., a gain of some 1450 ft. above Camp IX, much of it very severe climbing. Setting out then at 8 A.M. on July 21st, we planned to proceed to the E. of the buttress, up the snow gully. No ice had fallen in two days from the ice cliffs; they were uncracked and in very good condition. From the reddish rocks, where the two routes divide, a 400-ft. traverse to the E. over difficult rotten rock, below the buttress, steep and snow covered, brought us to a short ice chimney; this chimney ended in 50 ft., some 80 ft. below the end of the ice wall, at the beginning of our snow gully. Step-cutting was necessary—there was a hard icy crust to the snow—had Lama not lost his crampons we would have been saved this; 400 to 500 ft. of such steps would be necessary. That could not be done in one day. Returning, it was too late when we reached the junction of the two routes under the butress to try the first route again, and we returned to Camp IX early in the afternoon. On July 22nd, we descended to Camp VIII, as our supplies were low, leaving everything at Camp IX except Pasang Lama's sleeping-bag. Wolfe was much pleased to see us, telling us no one had been up from below. The three or four days' provisions at Camp VIII we considered insufficient for another summit attempt, so we all decided to continue on down to Camp VII where a large supply of provisions had been left on the 14th. During this descent we had a slip on a short ice slope, on the gentlest part of the route. I was able to catch the fall and after some delay—Wolfe had lost his sleeping-bag in the slip —we reached Camp VII. Utterly unanticipated, we found Camp VII had been largely evacuated. The reserve sleeping-bags, air-mattresses and much of the food had been taken away. One tent was useless, the other still serviceable. In it were some 30 lbs. of food, two stoves, and meta sticks in confusion. We had put in a long day, having left Camp VIII late, and now we were faced with spending the night at 24,700 ft. with one air-mattress and one sleeping-bag between the three of us. It was a miserably cold night. We could not conceive of what had happened to create such a situation; we could not understand why our reserves had been removed—all sorts of fantastic thoughts crossed our minds. We would be forced to descend to Camp VI for additional supplies

and sleeping-bags before attempting the summit again. We still very definitely planned on another summit attack, for the weather remained fine and promised to continue. Wolfe accordingly remained at Camp VII, while Pasang Lama and I started down to Camp VI, leaving our only sleeping-bag with Wolfe at Camp VII, planning to return in two or three days with more Sherpas for the second summit attack. Neither of us for a moment thought this was to be our last sight of each other.

Camp VI, too, we found evacuated; the tent and some food left, but all sleeping-bags and air-mattresses removed. Piled on top of yesterday's shock, this was overwhelming; a doubly difficult blow, as we were not in our best condition after the previous night's discomforts. Continuing on down, we found Camps V and IV in turn also evacuated. We were completely broken mentally, as well as physically, weak and very, very tired. Even Camp II was evacuated as to sleeping-bags and mattresses; we took one tent, used it as a cover, and spent another dreadful night there; our toes, already slightly frostbitten, were suffering severely now. My throat next morning gave trouble and for three weeks I could only whisper, and reached Basecamp that next day (July 24th) as truly broken mentally and physically as men could be. Cromwell and three Sherpas we found on the glacier, having been searching the upper Godwin-Austen Glacier, and they helped us into Basecamp.

I now learned that on July 17th, the day after the light snowfall, Tendrup and Pasang Kitar had descended to Camp IV where Kikuli ordered them back to Camp VII to assist the summit party; Tsering and Phinsoo meanwhile having been waiting at Camp VI, which camp Durrance had left, ill, on the 14th. Tendrup and Phinsoo then joined Tendrup and Kitar, and they went up to Camp VII. Tendrup calling up to Camp VIII but receiving no answer, convinced the others that we three—the summit party—had been killed high up on the mountain and that they (Tendrup, Kitar and Phinsoo) should salvage what they could—*i.e.*, the sleeping-bags and mattresses, from Camps VII, downwards. This they did, arriving at Basecamp July 23rd, telling the Sahibs at Basecamp that the summit party had been killed. Sleeping-bags and air-mattresses from Camps II and I had been removed at an earlier date, under the belief that there were sufficient sleeping-bags at

Camps VI and VII, and that the advanced party would bring down some with them.

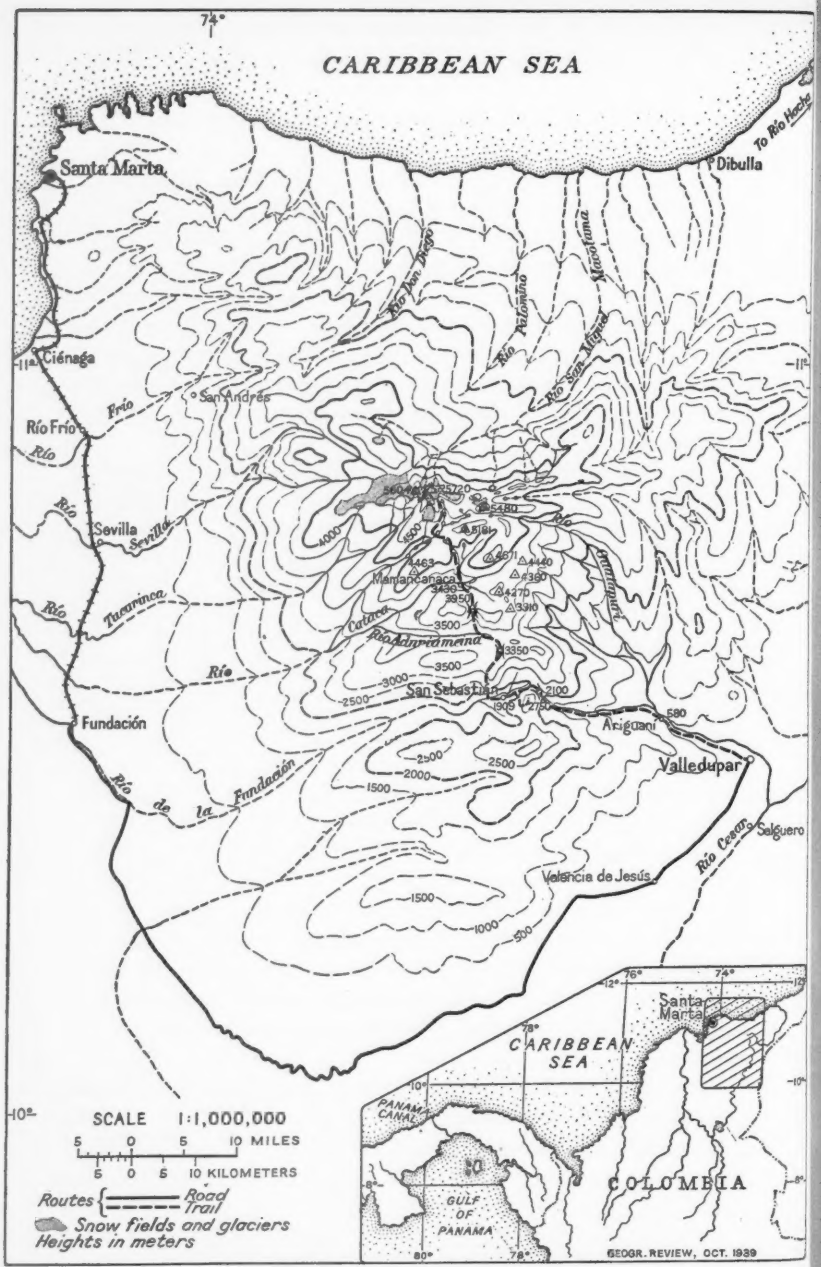
On July 25th, Durrance with Dawa, Phinsoo and Kitar went up to bring down Wolfe, but at Camp IV next day both Dawa and Durrance were ill, and returned on the 27th. On the 28th, Tsering and Kikuli started up with sleeping-bags, reaching Camp VI in one day—a magnificent feat. Kikuli, Kitar and Phinsoo went on to Camp VII on the 29th, finding Wolfe completely broken down and his tent in untidy condition. He was unwilling and too weak to descend, and asked them to return on the following day, when he would be ready. The three Sherpas returned to Camp VI that afternoon.

The 30th brought bad weather. The Sherpas went up again to Camp VII on the 31st, to compel Wolfe to descend, or else obtain from him a chit exonerating them from responsibility. Fire signals had been pre-arranged with Basecamp in case of difficulties, but none were observed at any time. A lone figure was seen outside the Camp VI tent on August 2nd; it was Tsering, who returned to Basecamp at noon of the same day. He reported the above, and that nothing had been seen of Kitar, Phinsoo or Kikuli after they had gone up the second time. As they had neither sleeping-bags nor food, it was impossible for the rescue party to have survived in those three nights of intervening bad weather.

On August 3rd, Tsering, Dawa and I, still very weak, set out for the high camps. After searching the glacier we reached Camp I, and, with great effort, Camp II, where we were held by heavy snowstorms for three successive days. Finally we were forced to descend to Basecamp, and on Augus 9th all left for Askole. It was certain that neither our brave Dudley Wolfe, whose determination and ability had grown the higher he went, nor the three unforgettable Sherpas, Pasang Kikuli, Pasang Kitar and Phinsoo, who so gallantly had done their best to rescue their Sahib, could possibly be alive.

They have, as their monument, a more beautiful structure than any man will ever erect, K2.

F. W.



THE SIERRA NEVADA DE SANTA MARTA, COLOMBIA

Courtesy of American Geographical Society

The Sierra Nevada de Santa Marta, Colombia

WALTER A. WOOD, JR.

HAVE you ever of a winter's evening reached up on your library shelf for your favorite atlas, settled down comfortably in a favorite chair and commenced thumbing over the pages with a vague but hopeful idea of finding some previously untouched range whose proximity and topographic composition might provide novelty for next season's climbing program? And, having given due consideration to the Himalayas, as you have done many times before, the Alps, Caucasus and New Zealand ranges, have you returned with a sigh of contentment to your favorite Coast Range, Selkirks or St. Elias, satisfied that nothing has escaped your notice? If so, you have missed the boat. If you had stopped at the map of South America, allowing your inspection to omit the great peaks of the Andes from Ecuador to Chile, your gaze might have alighted on an apparently insignificant area in northern Colombia called the Sierra Nevada de Santa Marta. It is not probable that you would have stopped there, for most atlases fail to inspire curiosity in their portrayal of these mountains. And if you had so hesitated and consulted alpine literature you would almost certainly have dropped the matter then and there, as there is nothing save a short sentence in *Mountaineering* describing the range as worthy of attention. The purpose of this paper is to describe the climbing aspects of a visit made to the Sierra in March, 1939.[1]

Without a doubt one of the most interesting things about the Sierra Nevada de Santa Marta is the lack of information concerning it. It would not be unfair to say that more has been written on the remote ranges of Asia or of Antarctica than has ever appeared on the Sierra. The more astounding is it then when you discover that here is, by almost any definition, the highest coastal massif in the world, with peaks rising to approximately 19,000 ft. within 30 miles of the Caribbean coast of Colombia, girdled on the W. by a railroad and on the S. and E. by graveled motor roads.

[1] For a complete report on many aspects of geographical interest in the Sierra Nevada de Santa Marta see "The Cabot Expedition to the Sierra Nevada de Santa Marta of Colombia"; *Geographical Review*, xxlx, 587.

The important banana lands of Santa Marta snuggle against the foothills and the snow-crowned summits are visible from the modern city of Barranquilla. During the dry seasons and sometimes during the rains, ships bound for the coastal ports sight the high peaks from miles away, while pilots of planes flying S. from Miami use them as landmarks from 100 miles off shore. Finally, the Sierra is but slightly more than 2000 miles from New York and while some of our own Rocky Mountains fall within such a radius none are alpine in character to the same extent as the Sierra. They can be reached in less than twenty-four hours from New York by air and in less than a week by sea. Despite all this no serious mountaineering party entered the range previous to 1939 and a bibliography of the few investigators who have studied various aspects of the lower slopes is short indeed.

The Sierra massif is an isolated offshoot of the Eastern Cordillera of the Andes. It is surrounded by lowland on three sides and the Caribbean Sea flanks it on the N. If the sea were to rise less than 1000 ft. the range would become an island. The massif reaches its greatest elevation some 30 miles from the coast, then slopes gradually to the south for about seventy miles to the valley of the Reo Cesar, a tributary of the Magdalena. There are three routes by which the high peaks may be reached; from Dibulla on the coast, which exposes the traveler to the malaria-infested rain forests of the northern slopes; from Rio Frió on the W., the most direct route but unsuitable for animal transport through the steepness and inadequacy of the trails; and from Valledupar on the S., the longest approach, but offering good trails and exempt from the danger of malaria.

In 1930 Thomas D. Cabot saw the high snows from the deck of a cruise ship, immediately disembarked at Santa Marta, and spent two weeks investigating possibilities of ascent. Attempting to reach the peaks by two routes on the N. and W. slopes, he finally reached 13,000 ft. above Rio Frió only to find himself cut off from his objective by a maze of intervening ridges and valleys.[2] Since that date he had sought an opportunity to return and complete the job.

The dry season in Colombia occurs in the first three months of the year and, having long since succumbed to Sierra Nevada

[2] "Mountains of the Caribbean"; *Appalachia,* xviii, 17.

THE CENTRAL AND EAST PEAKS SEEN FROM THE SOUTH

The Germans climbed the Central Peak by the glacier in the foreground to the summit ridge which runs directly towards the camera

Photos, W. A. Wood, Jr.

EAST PEAK FROM THE AIR AT ABOUT 20,500 FT.
Route of ascent indicated

EAST PEAK FROM AIR, SHOWING ROUTE OF ASCENT

THE EAST, CENTRAL AND WEST PEAKS (FROM LEFT TO RIGHT)
SEEN FROM THE NORTH AT 20,500 FEET

propaganda, there came like a bolt from the blue a phone call from Cabot asking me to join him in an exploration of the range and an attempt on the high peaks—no, not in 1940—but sailing from New York in less than two weeks. And so it came about that Cabot and Henry Hall flew luxuriously to Barranquilla on February 22nd, leaving Anderson Bakewell and myself to follow by boat in charge of some 1000 lbs. of baggage.

On March 23rd we assembled in Santa Marta, the seagoing contingent being greeted even before it had disembarked by the disconcerting news that a German party had just returned from the range and had climbed the Central Peak of the main group. Why is it, I wonder, that two climbing parties so often seek the same objective, each independent of and completely unbeknown to the other? And the more so "why" here in the Sierra Nevada de Santa Marta which has stood within sight of all comers for centuries without so much as a mountaineering finger being raised in its direction. The German party bore the awe-inspiring title of Deutsches-Kolumbien-Kordillera Expedition, and of its five members three had reached the summit. Of these one, a Swiss-Italian prospector named Praolini, was in Barranquilla and was persuaded by Cabot and Hall to accompany our party. Discouraging as was the news of the German conquest, we determined to carry out our original plan for, in the only published photograph of the highest peaks, a photo taken from 20 miles away, it could be seen that the central summit had an eastern neighbor which appeared to rival it in height and Praolini stated that, from the summit of the Central Peak it appeared as though the two were *ganz gleich.* The East Peak was then to be our goal.

We left Santa Marta and the lavish hospitality of the United Fruit Company on March 4th, traveling by rail to the terminus at Fundación and thence by truck to Valledupar, reaching the latter on the evening of the same day. Losing no time, a creditable feat in Latin America, we enlisted mules to carry ourselves and our supplies over the first part of the route and were under way by noon of the next day, making our way along the bank of the Guatapuri River and into the foothills of the range. The dry forest through which we passed was lovely in the extreme. Overhead whirled screaming macaws and parrots; flowering trees rose in a tangle on all sides and, though the heat seemed excessive to

us who had left winter behind only a short ten days previously, the gushing torrent at our side provided the wherewithal to quench an unruly thirst. The delights of the trail were all too quickly dissipated. We camped that night at a corral called Ariguani and during our occupation were speedily and effectively devoured by the whole gamut of tropical pests—ticks, sand flies, fleas and chiggers. Probably we should not complain too much for this persecution lasted only one night. The following day we crossed a 7000-ft. pass and dropped into the settlement of San Sebastián at 6400 ft., above the limit of even the most persistent tick.

We spent two days at San Sebastián negotiating for bulls to carry our equipment to the higher country and were greatly aided in so doing by the fathers of a Capuchin monastery whose history goes back prior to 1680. During the two days we stretched our still protesting legs by climbing the 9000-ft. summit of Figueroa for survey purposes and were rewarded with a late afternoon view of the first snow peaks of the range 20 miles to the north. The highest snows were cloud covered but their satellites beckoned encouragingly and provided the stimulus for an early start the following morning on the long climb ahead.

Up at four, the six bulls and two mules were packed and under way by six. After considerable indecision as to the way, we found ourselves climbing by steep zigzags towards the *paramos* or grass-covered uplands. Dehydration from a scorching sun plus our first contact with moderate altitude produced an acute lassitude in nearly all of us who, unwilling to admit of such a complaint, contrived to produce all manner of excuses to dawdle and it was mid-afternoon before we reached a pass at 11,400 ft. and dropped a few feet to the head of the Aduriameina Valley where a camp-site of doubtful virtue, due to its limited water supply, was found.

Here we saw the first traces of former glaciation. On the north slope of the valley were several terminal moraines and above our camp a large lobate moraine descended to below 11,000 ft., the lowest altitude at which we saw definite traces of past glaciers. The high rocky peaks above us had by now taken on the appearance of having borne ice, their slopes being smoothly scoured, though with few cirques and no remnants of ice. An interesting characteristic of the upper slopes of the Sierra Nevada is the fact that the topography appears to have supported an ice mantle but yesterday, so

clean is the scouring and so perfectly preserved are the moraines. However long ago it was that glaciers mantled these slopes (11,000-15,000 ft.), it is the opinion of Mr. Frank Notestein, chief geologist of the Colombian Petroleum Co., who accompanied us, that the glacial epoch was of rather short duration and that such glaciation began in the late Pleistocene.

On March 10th we crossed a 12,600-ft. pass and from its crest had our first comprehensive view of the great peaks of the main range about twelve miles to the north. Three high peaks stood out sharp and clear against a cloudless tropical sky. Praolini pointed out the route followed by the German party to the Central Peak and we immediately set to work speculating on the relative height of the East Peak. Vertical angles measured with the theodolite were no encouragement for these gave a greater angle to the Central Peak. At once all sorts of thoroughly unsound reasons were advanced as to why the angles were no true indication of relative height. Only one held water; to be higher the East Peak must be further away, and this appeared to be the case. The discussion dragged on as we descended into the Cataca Valley where we camped at a corral called Mamancanaca, snuggling between two huge lateral moraines at an altitude of 11,250 ft. Our triangulation later showed that the moraines rise over 900 ft. above the valley floor.

Mamancanaca was to serve as our base camp and so we dumped our return supplies and superfluous equipment there in order to reduce the loads which the animals were to carry to the higher camps. Though a good idea, we had not counted on a number of our animals disappearing during the night and when we came to pack our remaining animals the following morning each beast had at least the equal of its previous day's load. We were not long in having this state of affairs borne out to us. Despite an early start, the hot sun and the altitude soon made itself felt and one after the other the laden animals lay down, and once down no device which we could conceive would get them started again until the spirit so moved them.

In mid-afternoon we entered a deep and sullen glen, shut in to right and left by towering walls of rock and in which lay a number of deep blue lakes. Making our way around these we reached the highest and found to our dismay that our animals had reached the

end of their journey. Instead of an easy saddle connecting our glen with drainage from the high peaks, there rose at the far end of the lake a steep and rocky couloir giving access to a notch in the ridge, the only break in the perimeter of cliffs save the defile through which we had come. We named our surroundings "Gloomy Gulch," a name which described not only our surroundings but our feelings as well. Our altitude was 13,500 ft.

At this point a combination of circumstances made it advisable to split the party. First of all, altitude was making itself felt on several of us; secondly, it was felt that, now that the animals could go no further, a small climbing party would have a better chance of success than a large one; and finally, since climbing was only one of the interests of the trip, a wider understanding of the geology and complex topography could be had if our itineraries diverged. Consequently Cabot and Notestein went off to investigate the neighboring valleys and ridges while Hall, Bakewell, Praolini and I with a week's supply of food turned toward the high peaks.

On March 12th we backpacked loads over "Gloomy" notch and camped beside a crystal clear lake in the valley at the head of which stood the East Peak. This valley, above the point where we camped, contains three large lakes, all occupying glacier-formed depressions and flowing one into the other in swift-running streams and waterfalls. From below it seemed impractical to follow the margins of these lakes and so we packed our loads high onto the retaining slopes and then traversed across talus, grass and slabs to the shore of the highest lake at 15,000 ft. It was a day not soon to be forgotten and the less said of it the better, climaxed by the stubborn refusal of what Hall called the "ultimate in pressure stoves" to produce heat for more than a few seconds at a time.

The following morning we moved forward once more and, following the axis of the now narrowing valley, reached a campsite by a pool of glacier water a few hundred feet away from the ice wall which forms the terminus of the glacier. The altitude was 16,500 ft. All in all, it was a happier day than yesterday for not only did the stoves behave a trifle more normally, but the monotony of packing heavy loads was relieved by our coming face to face with, not a mountain sheep or goat, but a plain, ordinary cow. The hilarity of such an encounter at such an altitude (about 15,700 ft.) so

affected us that packs were forgotten for at least a quarter of an hour!

From the 16,500-ft. camp the obvious route appeared to be one which followed the true right (W.) margin of the glacier to a point safely beyond the much-crevassed lower portion and thence over moderately steep snow to the col between the East and Central Peaks. The final ridge to the summit seemed to present no difficulties.

At 7 o'clock on March 15th we left camp and in an hour were making our way up the trough between the ice-cliffs of the glacier and the rock wall of a spur of the Central Peak. Gradually this became more encased and forbidding and finally we were brought to a halt where the ice became annealed to the rock wall in a vertical joint over 100 ft. high. Neither rock nor ice could be climbed and, after an attempt to reach the surface of the glacier had shown that we were still in the midst of the unthreadable lower icefall, we called it a day and returned to camp. Arrived there, out came the field glasses and for the remainder of the day we studied alternatives.

The following morning Hall, who had packed tremendous loads up from "Gloomy Gulch," was feeling unfit for another attempt, so Bakewell, Praolini and I left camp at 6.45 a.m. and this time made for the eastern flank of the ice. Some delicate scrambling on ice-smoothed slabs brought us to the least forbidding portion of the frontal cliff and some intricate and well-executed maneuvering by Praolini brought us onto the less crevassed surface of the glacier. Up this we slowly made our way, progress being hampered by razor-sharp *nieve penitente*. I have yet to decide whether this tropical snow condition is more wearisome than deep soft snow, for one breaks down the brittle ridges just as the weight is thrown forward to the next step and sinks in, usually knee deep, in a mutilated mass of ice crystals.

At about 10 o'clock we reached the ridge which falls away abruptly to the rain forest of the N. slope. Through gaps in low-lying clouds could be seen the shore line and blue water of the Caribbean. We had now the alternative of passing below the S. face of our peak and joining our intended route of yesterday above the icefall or of climbing the steep rocks of the face itself to the E. ridge. After some debate the face route was chosen and the real work began. A steep rock step gave access to a couloir and up

this we made our way. The rock was excellent, a biotite granite rich in quartz, and though steep and exposed, the rock provided holds of gratifying proportions. Shortly after noon we emerged on the crest of the E. ridge. Here ice was present and steps had frequently to be cut, but progress was rapid and at 1.15 P.M. we gingerly examined the cornice of the highest point and, finding it to be almost non-existent, sat down to reply to the shouts reaching us from Hall in camp below.

Throughout the climb clouds had been boiling up from the south and by the time we reached the summit the entire range was blanketed, the sole exceptions being the Central Peak and our own. We were naturally much interested in the relative heights of the two summits and had brought a hand level to determine approximately the vertical angle between them. Four readings were taken. Two of these gave slight depression angles to the Central Peak, one gave a zero reading and one a positive angle. At all events the difference of elevation between the two highest points of the Sierra Nevada appeared very slight and this was confirmed on our return when the triangulation indicated a difference of only two meters in favor of the Central Peak. On the map resulting from our work, both peaks will bear the same height since it seems likely that the relative heights will vary from season to season due to fluctuations in the heights of the snow cornices.

The descent was uneventful. Mists swirled about as we roped down the rock face and obligingly lifted as we reached the glacier. From above a route was picked out which led us around and across innumerable crevasses and emerged immediately above camp. We were then treated to the rare privilege of roping down the ice front of the glacier and finding ourselves home through the back door.

A week later we arrived in Santa Marta and two days later flew over the range to secure air photographs necessary to the topographic survey and, these having been successfully obtained, there ended a month's work in a region which offers the climber endless possibilities. There are at least five unclimbed peaks of from 17,000-18,400 ft. and a score over 14,000 ft. All of these present problems of approach and ascent, and should provide climbers with as keen enjoyment as any mountains in the world.

Two First Ascents in the Bolivian Andes

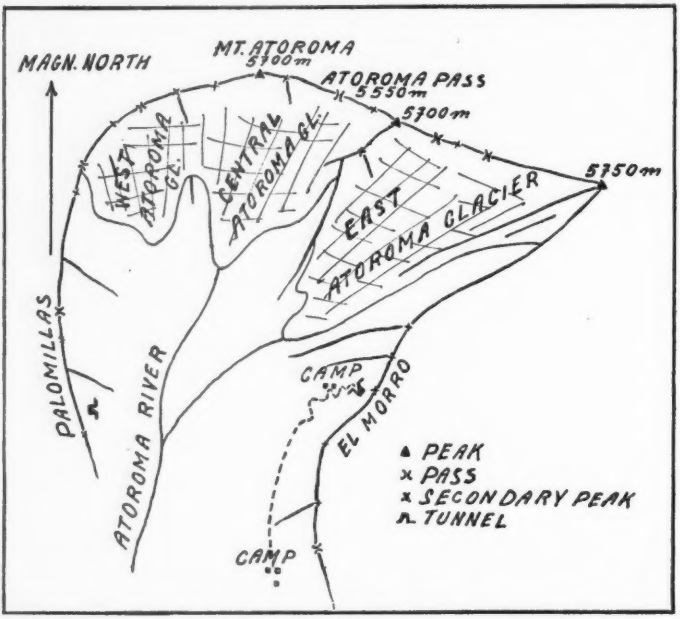
Joseph P. Prem

IN Bolivia[1] the Cordillera de los Andes that stretches through the whole continent of South America reaches its greatest width, although not its greatest height. It consists essentially of the Western and Eastern Cordilleras, separated from each other by a high (average 3800 m.) non-draining plateau, with dry, cold climate and scant vegetation—the Altiplano. The Western Cordillera is made up entirely of volcanoes and is attractive from a climber's point of view only where erosion has removed the loose and soft material, the remaining harder rocks forming rugged crests like Mt. Sajama (6520 m.), N. Payachata (6420 m.) and others. The excessive dry climate accounts for the high snowline (5600-6000 m.), so that only a few of the peaks and none of the passes carry a permanent snow capping, with but very small glaciers. The Eastern Cordillera, of mountaineering interest only in Northern Bolivia, consists of slate or granite, and forms where this latter is exposed world-renowned peaks like Mt. Illimani (6400 m.), Mt. Huama Potosi (6200 m.) and Mt. Illampu (6500 m.). Without regard to the Cordillera de Apolobamba, which is in the extreme N. and stretches into Peru, and also carries a few glaciers, the Eastern Cordillera can be divided into two parts, separated by the deep gorge of the La Paz River: a bigger and higher N. W. one called Cordillera Real, which bears the above mentioned high and gallant peaks, and a smaller and lower S. E. one, the Cordillera de Quimza Cruz. Although this nowhere reaches 6000 m., there is only one ice-free pass, the Abra de Tres Cruces (Pass of the Three Crosses). In the N. W. the Quimza Cruz range is composed of slate. Here, therefore, the peaks show more rounded forms but are higher and carry longer glaciers.

The Ascent of Mt. Atoroma (5700 m.; Quimza Cruz Cord.). August 4th, 1928, during the Bolivian national holidays I took the train in Oruro, at that time my headquarters, and went to

[1] See Map of Hispanic America (La Paz sheet), Am. Geogr. Soc.. N. Y.; also Map of South America, Natl. Geogr. Soc. [The author, a mining-engineer, has been interested in the American Alpine Journal since its inception, and sends his most acceptable Ms. by airmail from Tirapata, Peru.—*Ed.*]

Eucaliptus. On a fairly good motor road I crossed the grass and tola (a common bush) covered foreland, consisting of flat stretches called pampas, and intervening ridges with occasional fine glimpses of the snow mountains, to the village of Caxata, on the very foot of the Quimza Cruz Range. Here begins the scenic part of the



UPPERMOST ATOROMA VALLEY AND SURROUNDING MOUNTAINS—1:45,000

trip, the road winding in serpentines over red sandstone hills toward the Tres Cruces Pass. Before reaching it we take the branch road that leads on the S. W. side of the range to Araca, its terminus. Grand is the sight to the left into the red and blue gorge of the Luribay River, which flows N. W. and collects the glacial waters from the Cordillera. Successively we pass the valleys of Monte Blanco, Chejñacota (Green Lake), Laramcota (Blue Lake), Mallachuma—each with superb glacial background of wonderfully colored lakes—until we arrive at the Atoroma mine. With a letter of introduction from the owner of the little tin-mine

I soon made the acquaintance of the administrator, Mr. Krueger, and the storeman, Mr. Perowitsch, who was to accompany me on my ascent.

The next day, August 5th, with a workman from the mine, I made a reconnaissance trip up the central Atoroma Glacier to the Abra de Atoroma, the view being limited because of fog. The 6th of August I spent surveying and geologizing.

The weather was promising on August 7th, so Perowitsch and I left at 7.40 A.M. with the intention of ascending Mt. Atoroma. A small trail led to the head of the Atoroma Valley, then we followed the left orographic moraine of the central glacier to its end, continuing straight up the névé close to a big crevasse and proceeding to a ridge at the right hand, beyond which the névé is broken by big seracs. Crossing a depression and step-cutting upwards again, we eventually gained ground above the seracs, ascended again to another crevasse, which we followed and finally crossed by a narrow bridge near its left upper end. We steered to a ridge to the right, then keeping somewhat to the left over the flattening névé reached the Atoroma Pass, between the Cerro de Atoroma on the N. W. and another big peak to the S. E. It was noon, the weather had improved so that not a cloud was to be seen, and the temperature was very refreshing. Far to the W., beyond the gorge of the Luribay and the brownish Altiplano, the snow peaks of Mt. Sajama and the two Payachatas had slowly risen. From the pass to the E., where it breaks down in terrible seràcs, the eye reached the Cordillera de Choquetanga, a N. branch range of the Quimza Cruz, with small hanging glaciers. Through the gap between the two ranges appears one forested ridge after another until in the blue distance they merge into the Amazon plain. A warm current rises from these woodlands.

After a short rest and a little lunch we went on again, first straight up the S. E. arête of Mt. Atoroma to a crevasse, which we crossed on a mighty bridge—as we did a second smaller and finally a third and very wide one. Keeping somewhat to the right we gained a ridge just above a projecting rock and followed it to a shoulder. Over a depression we proceeded to the S. E. corner of the summit ridge, and from there to the summit at the N. W. As my companion was complaining of headache I had to take the lead all the way. Splendid was the sight of the Quimza Cruz Range

and of Mt. Illimani beyond the La Paz River, rising a sheer 15,000 ft. above the gorge. Deep below us to the E., at the foot of the cliffs, appeared the sheet-iron roofs of the Bengala mine. After depositing a visiting card with the date in the nearest rock, somewhat below the summit to the E., we went down again to the pass. We crossed the névé of the Atoroma Glacier below the S. W. face of our mountain, thence descending to the right orographic moraine and on to camp. The people told us they had seen us clearly emerging on the S. E. arête and on the summit.

I spent the two following days (August 8th and 9th) surveying and making geological observations, especially of the contact between the granite and the slate. I also went up the E. Atoroma Glacier to its névé, to the right being El Morro with mine workings at 5500 m.

My vacation came to an end, so next day I took a camion and went back to Oruro, satisfaction in my heart and not without throwing a last glance at the glorious shining glaciers of Quimza Cruz before they disappeared behind a ridge.

The Ascent of Mt. Parinacota (6330 m.; W. Cord.). On the morning of December 6th, 1928, I went by train of the Bolivian Railway from Oruro to Viacha, changed to the Arica-La Paz R. R. and arrived at Charaña, the Bolivian frontier station, at midnight. A heavy thunderstorm had burst, the first sign of the rainy season. One day I spent in hiring a mozo (servant) and animals. On December 8th, at 10.30 A.M., we started southward: I, the mozo, one saddle-mule and a cargo mule. Ahead of us 80 km. distant loomed the snowy giant Mt. Sajama, and somewhat to the right of it Mts. Parinacota and Pomarape, these two called the Payachatas. Most of the other peaks of the W. Cordillera, on whose inner feet Charaña is situated, have pointed forms and red, brown and white colors, but carry no perpetual snow. Over pampas, for the most part covered with tola bush, we went on. Sometimes there is a hissing in the bush—one of the frequent dust-whirls in formation. Later on the terrain becomes broad waves as we approach a great tufa plateau, and already in the dark we reach the ranche Cellpa, a group of Indian huts, through the canyon of the Kelatia River, where we spend the night.

NORTHERN PAYACHATA

Photo, J. P. Prem

NIEVE PENITENTE ON NORTHERN PAYACHATA

Photo, J. P. Prem

Next morning we crossed, the Abra de Laramkawa into the valley of the Aciuta River, and through a tributary valley continued to the village of Rio Blanco. Over another pass, with fine glimpses of Mt. Sajama, we reached at night the village of that name.

Spending one day in preparations, I started on December 11th with one saddle- and two pack-horses of local race—small but resistant—for Mt. Parinacota, or Payachata Grande, accompanied by the Terrans, father and son. First we went over the plain on which Sajama village is situated, then over gently rising ground covered with maja (coarse, sharp-pointed Andean grass), tola bush and Queñea trees, where charcoal-burners make a little industry. Later we followed a second valley leading toward Mt. Pomarape (N. Payachata), crossed a ridge and ascended a second valley, coming down between the two Payachatas, extremely desolate and grassless—no bush, no tree. It is filled with volcanic ash and sand, into which one sinks to the ankles, bombs and solidified lava weathered to odd forms. There are lava blocks rolled up like snowballs, and some of the lava weathers to thin slabs that clink when one touches them. While my companions pitched the tent, I went on to the pass between the two Payachatas.

December 12th was clear, so I decided to make the ascent. At 8.30 I left camp with the younger Terran, ascending toward the mighty stream of lava that comes down the E. flank of the mountain. Over this flow, which in places is weathhered to coarse blocks, and in others covered with sand and bombs, we ascended with toil to the snowfield that stretched down to the pass between the Payachatas and shows the characteristic Nieves Penitentes in initial stages. Up we struggled on the ash cone, inclined at 33°, infinitely painful and causing us to stop for breath after every two or three steps. In many places ice is hidden below the ash and makes going dangerous. To estimate the distance to the rim of the crater is impossible, as it remains invisible until one is close by. Far below our camp appeared.

At 3.15 we stand in the notch of the crater's rim, proceeding after a short rest to the highest point a little to the N., where I deposit a tin box containing my visiting card and the date in the tufa rock. The crater is elliptical, possibly 200 by 300 m., and approximately 100 m. deep. It breaks down toward its interior in almost vertical tufa walls, from which rocks are continuously

thundering. It is filled with Nieves Penitentes, and so is the rim of the crater. Most imposing is the sight of Mt. Sajama and the N. Payachata. At 4.40 we started the descent and were in camp in less than an hour, sliding down a stream of débris to the N. of the lava flow.

On the following day I ascended to the fields of Nieve Penitente on the slopes of N. Payachata, or Sajama, and made geological observations. Mt. Parinacota is a much younger mountain, showing no signs of former glaciation, and has a well-preserved crater. December 14th I returned to Sajama through the Payachata Valley and over the plain. There I was sick for almost a week, owing to an over-extended bath in a little stream under tropical summer sun at an elevation of 4200 m. The rest of the month I spent in exploring a few valleys that lead up toward Mt. Sajama. Then my mountaineering program was at an end. Setting out homeward, I travelled to Curahuara over tola heath and a tufa plateau, resting and visiting a nearby copper-mine. In two more days I reached Chacaillas another copper-mine, crossed the Desaguadero River, the most important stream on the Bolivian plateau, in a ferryboat, and finally arrived at Patacamaya on the Oruro-La Paz railroad. My trip was at an end.

War Comes to the Alps

URSULA CORNING

ON the 24th of August, 1939, the streets of Chamonix are as full as ever, but it is a strangely different crowd which surges up and down the way to the station. Gone are the familiar figures with sack and axe, rushing to catch the Montenvers train; gone the little knots of people gathering in front of the Bureau des Guides or shaking their heads over the vagaries of the barometer. This crowd is thickest at street corners, where the latest editions of the Paris papers are sold, or along the walls, where huge unfamiliar posters show the calling up of various military classes. It is a grave and silent crowd; there is not the faintest sign of hysteria and hardly a trace of recrimination or bitterness, in spite of many Gallic shrugs about the cruel futility of it all. Somehow the rushing of the Arve seems louder and more pressing than usual, and Mont Blanc shrouds himself in thick grey cloud in keeping with the general gloom.

At the barracks outside the village the guides are gathering fast, greeting their acquaintances cheerily and looking with faint surprise at their mostly rather ill-fitting uniforms. Travel agencies are crammed with anxious people of all nationalities, soon to be borne away in the neat little blue and white train down the valley, wondering when and how they will reach their journey's end.

Couttet's Hotel is the usual peaceful oasis. Old Monsieur Couttet passes with bent head across the garden, followed by the two faithful dogs. Half his staff has been taken, and his guests discuss their imminent departure. Scraps of conversation float in through the open window. A woman's voice speaks of her four small children in Belgium, then: "I don't fancy it's really necessary for a moment, but I'd better be at my place." An Englishman that! A querulous high-pitched voice breaks in: "They tell me in the village that the whole of Chamonix is to be evacuated by this evening!" This last sally creates great hilarity; lucky there are so many roomy huts on the glaciers roundabout!

We decide to send back G. (my Swiss guide), knowing he may be needed to guard his frontier. He demurs profusely, even going to the length of calling up his home and then proclaiming that well-informed opinion at Zermatt does not think the situation really serious. He suggests piteously that we should go to the Couvercle hut, away from newspapers, radios and telephones, and stay there till the storm has blown over. We are sorely tempted, but remain firm. While driving over the Col des Montets, suddenly the aiguilles show up in a blaze of glory, and we stay to gaze till they are veiled in cloud. We go on to the Swiss frontier, singing old songs defiantly, while English cars dash in the opposite direction—Chamonix to Calais, non-stop—written in every line of their retreating backs. G. won't let us wait at the station. "Think of me as shooting straight," he flings at us and then vanishes through the door, lugging after him the sack with four different ropes, from which we had hoped great things when we came to Chamonix but a few days before!

Next day Spinach (my trusted Ford) and I also left for Switzerland. I decided to go down the valley and across the hills to Evian, for the Forclaz, never an easy pass at the best of times, might be cumbered with military. It was a strange trip. Every barrier was down, and all sorts and conditions of people mingled in a common desire to be helpful in face of this general calamity. I gave many lifts on the way and wished I had room for more passengers. On every road we saw elderly men, many of them with tears in their eyes, bringing cherished mules to the nearest village to be requisitioned for army service. In contrast, carefree children waved to us, holding out tight little bunches of tiny fragrant autumn cyclamen. At the frontier there was no trouble. "Are you not afraid to cross the border?" a kindly customs officials asked me. "We should protect you well here." In a few days all these frontier villages were to be guarded by Senegalese soldiers. How homesick those men will feel when the heights are covered with snow and the cold mists rise up from the lake!

In Switzerland peasants were working in the fields, and there were horses and mules in plenty. It seemed like a peaceful refuge, but alas, this state of things was not to last. Three days later the frontier troops were called up. Above the Lake of Geneva where we were staying the clanging of a bell aroused us at 5 A.M., and

men hurried out onto the village street in uniform, followed by their women and children. They scrambled into a flower- and flag-decked lorry; the foreman of the community made a short address, and the men were carried away down the hill, to the sound of our good wishes. In most mountain villages, all the church bells were pealed, and at Zermatt they sounded the tocsin, otherwise only heard in time of fire or hurricane. Each soldier has his bit of frontier, for the defense of which he and he alone is responsible, and as he is invariably called up in his own home district, a special personal pride enters into it. An ingenious system of cross-firing makes it well nigh impossible for any enemy to break through.

Three days later the bells were heard again, but this time they rang all over Switzerland for the general mobilization. The Swiss lost no time in needless lamentation. Within two days the complete country was under arms, without a hitch anywhere, in fact we were assured that exactly ten minutes before England declared war, the last Swiss soldier was standing at his post. Smart-looking soldiers, no; but they are crack shots, and their morale is excellent. "Let anyone touch us, and they will find us a wasp's nest," is the universal attitude.

The early days of September were so beautiful that it seemed as if nature were trying to make up for her cruel treatment of us earlier in the summer. Those men whose service took them to the high Alps had a royal time, climbing everything within sight, under pretext of choosing observation posts, while their unhappier brothers in the lowlands dug trenches, mined bridges and were instructed in the grisly art of making barricades. (At Basle, the frugal soldiers planted lettuces on top of the broader barricades, a constant joy to themselves and to the townsfolk.) With the first snap of cold the tables were turned, and frantic appeals throughout Switzerland begged for warm clothing for the mountain troops. Guides, of course, are well provided for, but men from the valleys and remoter hamlets are often so poor that they wear their uniforms over bare skin. There will be great hardship this winter.

Life in our village was quiet, so quiet that it was hard to believe in the storm that raged in the world outside. Our only visitors were extraordinary swarms of bees, which suddenly appeared all over the countryside, like a plague of Egypt. We remembered the old tradition that all news, good and bad, must be told to the bees.

Perhaps they knew about the war and had come to do their bit by supplying us with an extra amount of delicious mountain honey?

One day a joyous sound of cowbells lured us onto the street, and there were all the cows coming down in herds from the high Alps, long before their appointed time. No one was left to look after them up there but women and children. Horses and mules had long vanished from the countryside; however, it's an ill wind blows nobody any good! Friends of mine who own a little farm in the Rhône Valley had long been looked down on by the neighbors because their purse could not run to a horse. Now it was their turn to smile. Hey, presto, every horse and mule had vanished, and it was their humble ox which was in universal request!

We had a blackout, chiefly memorable because the town crier seized one of the few cars allowed to circulate in these days of petrol rations and managed to ring a cowbell and announce the fact no fewer than thirty-two times in our small village. Thereafter whenever a cowbell rang, everybody rushed out, expecting some horrible tiding, till one day all they found was a veritable cow, escaped from its stall, parading majestically down the village street!

Now that everything is organized, the continued mobilization of the Swiss army is a serious problem, quite apart from the five millions of Swiss francs it costs the government daily. The men must be occupied and their morale kept up. So far, the authorities have been amazingly successful. Many of the men who are urgently needed on the land have been liberated, and others are commandeered to help the peasants. The vintage will be very late this year, owing to the scarcity of sun, but there are many grapes, and much help will be needed, even though women and children are rising splendidly to the challenge. The Swiss Exhibition, which in this year of all years has paid for itself twice over, is an indication of the national pride and spirit of cooperation in times of crisis.

G. keeps me well informed of Zermatt doings. He is an excellent letter writer, though, like most guides, his spelling is somewhat unorthodox! This translation from his last letter may be interesting, showing as it does the point of view in the Swiss ranks.

"I am a soldier now and stand firmly at my post. At first I was at Winkelmatten, then they sent us to Schönbühl and Gandegg and to the Matterhorn hut, and now I have been summoned back to the valley to bore shelters in the rock. It is not dull; there is

too much variety for that; but it was better once upon a time! It is pretty cold in the high places now at night. We have received orders to secure accommodation in Zermatt for many soldiers during the winter. So be it—we will bring every sacrifice for our dear Switzerland. Even if they demand the uttermost, my comrades and I will gladly give it, to help to annihilate the evil thing, which has cost the lives of so many and has plunged millions of people into misery. The silent mountains speak to me now as they never did in the days when I rushed off full of ambition to climb them. In those days I did not realize one half of what my dear mountains say to me today, and I shall never forget them till I die."

It was sadder than ever to leave the Alps this year. One of my last visits was to a well-known veteran member of the Alpine Club, marooned in Switzerland. He was sitting on a sunny terrace facing the Dents du Midi, and smiled cheerily at me, waving a khaki scarf. "There's nothing I can do nowadays to help except to knit," he said, "so I am doing that to the best of my ability."

It was a radiant day when we left. The soft blue haze of autumn lay over the Rhône Valley, and the snowy summits shone like visions. Below, the meadows were starred with autumn crocus, and the sound of innumerable cowbells was loud in the air. I was glad we were to drive over the Simplon Pass. There is no doubt that it is well fortified, and we were stopped at five different points and sternly forbidden to linger. We lunched at the Simplon Kulm amongst masses of soldiers in their smart blue-grey parkas and then plunged down into the warm mists of the Italian side of the pass. The Swiss soldier at the last barricade gaily saluted our car with its GB number and wished us good speed. He lifted the barrier—Switzerland lay behind us. Looking back to the heights, it was somehow comforting to remember in these mad and topsy-turvy times that "the righteousness of the Lord is like the great mountains," and that both will remain immovable whatever else may pass into oblivion.

Glacier Mechanics

ROLLIN T. CHAMBERLIN

IT is interesting to note how many of the pioneers of mountaineering in the Alps were men of notable achievement in other lines of endeavor. For centuries mountains and glaciers had been feared and avoided, but when this supposedly forbidden field was found to be singularly enticing and full of interest by those sufficiently venturesome to explore it, the lure of the mountains seems to have been felt most by those who were unusually vigorous, mentally as well as physically. In many of them, the stimulating hours of exercise on rocks, snow, and ice aroused a strong curiosity to understand better the natural phenomena with which they came in contact. New observations, novel and often surprising ideas featured the published accounts of their explorations, and speculative interpretations were advanced with the enthusiasm of a small boy with a new toy. Not a little of the charm of the mountaineering literature of these pioneer days lies in the observational and mental by-products of the early mountain conquests.

From De Saussure to Tyndall and even much later, climber after climber sought to explain how solid, crystalline ice could wend its way from a broad névé down a narrow, winding valley to the glacier snout. It was obviously rigid and brittle enough to crack easily into innumerable crevasses and yet, like a river, the moving ice molded itself readily to the valley configuration, swept around sharp bends, recovered its continuity after steep icefalls, and continued on still as brittle as ever to its terminus. It manifested other contradictions. Though appearing to flow like a river, or move downslope like a mass of soft tar, a glacier was found to scratch and groove the rock surfaces over which it passed, as if the rock fragments embedded in its basal portion had been held with the firmness of engraver's tools. This Jekyll-Hyde combination was an intriguing puzzle to many early explorers of glaciers. How was it that glaciers did these things? Various hypotheses were proposed, most of which contained some element of truth, yet none altogether satisfied the requirements. Controversies waxed and waned among adherents of different views, but the nature of glacier motion remained an unsatisfactorily answered question. As specialization became

increasingly the spirit of the times, mountaineers gradually retired from the field of glacier mechanics and left further efforts more and more to the geologist and physicist.

Later progress has been slow. Most geologists have devoted their summers in the field to other problems, while the physicists remained in their laboratories; too few of either have breathed the fresh air of the snowfields. Nevertheless, not a little has been learned in later years about the mechanical behavior of snow and ice in the large masses in which they occur in the mountains. Much, however, still remains to be done.

It has long been known that snow passes into glacier ice by a transformation of the snow flakes into granules through transfer of molecules by melting and freezing, together with settling of the individual granules and compaction of the mass. In 1938 this transition was given a careful investigation by Mr. G. Seligman's Jungfraujoch Research Party during five months of field work on the Aletsch Glacier, but as yet only very brief preliminary statements of their results are available.[1] They found that the winter cold wave had penetrated to a depth of about 15 meters by simple conduction, below which point the whole glacier was presumably at the melting point for the existing pressure. With the first spell of really warm weather early in June melt-water from the surface percolated downward in the névé until, on encountering the negative temperatures, it froze and gave up its latent heat thus causing the temperatures to rise rapidly towards O° C. The rate of temperature rise was found to depend on the névé structure and its permeability to water. By late mid-summer the whole of the glacier apparently was at the freezing point and remained so till the next winter cold wave started downward.

On the other hand, in very cold parts of polar regions where there is little melting, the glaciers are probably frozen throughout their mass even in summer, and Odell is of the opinion that the glaciers of Mt. Everest likewise have below-freezing temperatures down to the underlying rock.[2] Whether the mass of the glacier

[1] Jungfraujoch Research Expedition: Preliminary Report, *G. J.*, xciii (1939), 346. Results of the Jungfraujoch Research Expedition, *Association for the Study of Snow and Ice*, i, 2 (1939).

[2] N. E. Odell, "The Glaciers and Morphology of the Franz Josef Fjord Region of Northeast Greenland"; *G. J.*, xc (1937), 111. "Some Scientific Researches in the Region of Mount Everest"; *Nature*, 143 (1939), 545.

is at the melting point or considerably below will naturally make a difference in its mode of movement.

In an accumulation area where there is important summer melting, as near the Jungfraujoch, the surface melt-water seeps down through the névé until on reaching some thin crust or difference in the capillarity between two layers its progress is stopped and, when the temperature is below freezing, it congeals as a band of ice. In this way the névé acquires one variety of stratification. The other variety is due to dirt bands arising from wind-borne dust which accumulates on the surface of the snow field and is later buried beneath fresh snow. Both types travel far down the glacier tongue in the area of ice wastage.

The most striking surface features of the moving glacier are the crevasses, together with their offspring the jagged ice-blocks and seracs of the icefalls. They result from tension which cracks the brittle ice and, with further pulling apart of its walls, the crack opens into a gaping fissure. As the tensile stresses develop in different ways in different parts of a valley glacier, the crevasses are accordingly grouped in three categories. These are, as probably most mountaineers who have traveled much on Alpine glaciers have already observed: (1) transverse crevasses in the medial and larger portion of the ice stream, (2) diagonal crevasses along each side, and (3) longitudinal crevasses approaching the terminus.

No glacier in the mountains is flowing over a perfectly plane surface; instead it is passing over an irregular bed, some portions of which have a steeper slope, others a gentler gradient. Those who have walked up a mountain valley down which a glacier rode during the Ice Age, but from which it has since either disappeared entirely or else shrunk far back toward its source of supply among the high peaks, will probably recall that they rose by several fairly steep steps between which lay longer, leveller strips of valley floor like as not beautified by one or more small lakes. The old glacier had a rough journey. A river, given time, would smooth out its cascading course by cutting it down to a more uniform gradient. But the improvident glacier only digs deeper at the foot of a steep pitch increasing its height, though leaving us later the legacy of a charming tarn or mountain lake. In the living glacier the icefalls, terribly riven by crevassing, mark the steeper pitches of its uneven bed.

In passing over even a slight convexity of the underlying rock surface the sheet of ice must bend accordingly because of the cooperation of gravity. To give the necessary curvature its upper surface must be stretched. Ice will bend readily enough under slowly applied compression, but under tension its strength is much less and it cracks apart instead of stretching notably. As the direction of greatest tensile stress is here essentially that of the ice movement, the ice cracks most easily, according to a well-known principle of mechanics, in lines approximately at right angles to the glacier flow. Thus arise the *transverse crevasses* which trend across the valley. Tension, developed as outlined and possibly produced also by the upper portion of the glacier moving faster than that beneath, pulls the walls of some of the cracks apart opening crevasses.

The troublesome *diagonal crevasses* which one encounters along each side of the ice stream are to be blamed upon the differential movement of the ice down the valley. They run diagonally upstream inward from the glacier margin toward the middle portion. At moderate distances in from the margin the trend changes to approach that of the transverse crevasses which run more nearly straight across the glacier. These marginal crevasses running obliquely upstream from each side, combined with the transverse crevasses in the middle portion of the glacier between, give a general arcuate pattern of crevassing, convex upstream. This seems very strange indeed, for as everybody knows that the middle of a glacier moves down the valley faster than the ice on the two sides, one would certainly expect the crevasses to cross the glacier in curving lines convex downstream. The dirt bands on the surface do curve just that way. So also the lines of secondary shearing. Intelligent observers are often perplexed by this seemingly strange behavior of the crevasses. An engineer at the Kennecott copper mine in Alaska once asked: "What is the matter with this crazy glacier?" as we looked down upon the big Kennecott Glacier close by. Nothing was the matter; it was behaving quite normally. It crevassed as it did for the very reason that the middle was moving faster than the sides!

Suppose one were to select a relatively flattish portion of the surface of the glacier close to one side and measure upon it a line 100 yards long from a point near the ice margin straight in toward

the middle of the ice stream. Suppose at intervals of ten yards he drove in stakes (to be reset when necessary) or placed flat slabs of rock which would maintain their position on the ice for a few weeks in spite of the daily melting. Because the ice moves more and more rapidly with increasing distance from the side, he would find, after a while, that the line of stakes, originally running straight in from the glacier margin, now extended diagonally downstream. Whether the line remained straight or not, stakes 1 and 11 at the two ends would be more than 100 yards apart instead of the 100 yards that formerly separated them. Although the lengthening of the line involves shearing as well as stretching, there is, at times, sufficient tension developed in the direction of the line to cause the brittle ice to split in a crevasse at right angles to it. As the direction of tension is diagonally downstream from the margin of the glacier, whatever crevasses form will extend diagonally upstream from the margin.

Where the snout of a glacier does not cover the full width of the valley floor, the ice tends to spread out as it moves toward its terminus. The resulting tension, concentric with the curving end of the glacier tongue, splits the ice into crevasses at right angles to the edge of the ice, or parallel to the direction of ice movement (Fig. 1). Forming in the direction of ice flow, these are *longitudinal crevasses.*

In the lower tongue of a valley glacier, where the thrust from behind is great, there is nearly everywhere developed the familiar *banded, parallel,* or *ribbon* structure described by many authors, though with much difference of opinion as to its origin and significance (Fig. 2). One may observe readily that this structure is of a twofold nature, consisting in part of planes of slippage and even distinct fractures, and in part of thin bands of relatively transparent, bluish ice essentially free from air bubbles, alternating with thicker bands of more opaque, whitish ice filled with air bubbles. The lines of this banding on the surface of a glacier tongue invariably parallel approximately, or are concentric with, the curving glacier margin (Fig. 3). Near the sides of a long tongue the banded structure stands nearly vertically though in general dipping in toward the middle of the glacier; near the terminus it dips upstream at lower angles. Thus, wherever examined, the dips are prevailingly inward toward the direction from which the thrusting comes,

FIG. 1. LONGITUDINAL CREVASSES, BRENVA GLACIER, ITALY
Curving banded structure also apparent

FIG. 2. BANDED STRUCTURE ON SIDE OF BRENVA GLACIER NOT FAR FROM TERMINUS

Photos, R. T. Chamberlin

FIG. 3. FURROWED SURFACE OF RIGHT MARGIN OF GORNER GLACIER, SWITZERLAND

FIG. 4. TERMINUS OF BRENVA GLACIER SHOWING THE CHANGE IN INCLINATION OF BANDING IN RELATION TO POSITION

Photos, R. T. Chamberlin

and in fact, together with the curving trend of the banding, are a very convenient means of determining one's approximate location on a large glacier in time of fog.[3]

The changing trends and dips are precisely what are required by the mechanics of shearing in solid material. In the central, axial portion of the ice tongue the major thrust is down the valley, and the ice from behind shears up and over that in front, along planes dipping upstream and trending across the valley. Well back from the terminus, particularly where the lower ice tongue has a gentle gradient and hence there is much flat-lying glacier in front to offer resistance, and where an icefall behind develops strong thrusting, relief is obtained by some upward movement of the ice as well as forward movement. Because of the strong upward component of the ice movement, the inclination of whatever shearing planes develop becomes steeper, and may even reach verticality in such portions of the glacier. On the other hand, as the lower end of the glacier is approached and the frontal slope steepens, resistance to the forward thrust of the top portion of the glacier is greatly reduced, both actually and relative to the resistance offered to the basal portion. Hence the upper ice shears over that beneath, along planes which become progressively lower in angle toward the end of the glacier. They may even reach horizontality or, if the terminus is located on a considerable slope, may even dip slightly down the slope (Fig. 4).

Along the side of a glacier tongue the movement is somewhat different. At the surface of the faster-moving valley glaciers the velocity in the middle may be more than ten times that at the sides, though in the slower ones the proportion may be only three to one. Much of this differential motion is of the nature of shear, as ice moves past ice. We may in fact picture a forward movement of longitudinal strips of ice at different velocities. Where distinct planes of shear are visible, they naturally stand nearly vertically, or inclined steeply toward the middle of the glacier, and trend (strike) in the direction of the movement which is approximately parallel to the glacier sides (Fig. 3). A component of thrust from the

[3] One needs to remember, however, that in case several separate glaciers have coalesced into a large trunk glacier, each contributing unit retains its own individual banded structure far down the valley and very commonly even to the terminus of the composite glacier.

middle of the glacier outward modifies dip and strike to a varying extent depending on the location.

The slip along most of the planes is probably slight, but along some it is very considerable, rock débris in some cases being dragged up from the base of the glacier. In fact an accumulation of dirt in these zones of shearing is a very familiar observation. The writer once noted along the west side of the powerful Valdez Glacier in Alaska a strip of water-worn pebbles dotting the surface of the ice where it was intersected by a prominent inclined shearing plane. The line of pebbles was nearly parallel to the side of the glacier, about 100 yards in length, and a few score of feet in from the edge. The pebbles obviously could have been rounded only by a stream flowing beneath the glacier; they were quite unlike the angular fragments of rock which fell from the neighboring cliffs. From beneath the terminus of the glacier, about a mile and a half away, many small sub-glacial streams emerged, branching into such a network of channels that it had required some ingenuity to get from Valdez village onto the glacier without wading above boot tops. It was perfectly clear that the ice on one side of the observed shear plane had moved up the incline and had dragged with it an abundance of water-rounded pebbles from one of these sub-glacial stream courses. Melting, however, had practically obliterated other evidence of the very considerable displacement of ice which must have taken place. The thickness of the glacier beneath the line of pebbles may be inferred from the fact that they were some fifty feet above its nearby edge.

As the variation in movement from place to place is but the appropriate local manifestation of the movement of the glacier as a whole, so the banded structure has definitely related trends and dips throughout the ice tongue. Viewed from an adjacent mountain summit, its surface trend lines are seen to curve like a parabola concave upstream.

The so-called *blue bands* are another feature of the banded structure and serve to make it more conspicuous by the color difference. They are bands of clear, bluish ice from a fraction of an inch up to several feet in thickness, nearly free from the air bubbles which give the ordinary glacier ice on either side its whitish appearance. While some stratification does develop in the névé by the formation of bands of bluish ice from the freezing of melt-water in zones,

the characteristic blue bands of the lower glacier tongue are oriented like the shear planes and, like them, are developed by the internal deformation of the glacier. Not uncommonly one set of parallel blue bands is found crossing another set at an acute angle. In places, particularly in a long glacier which has undergone changing stress orientation, the bands of one set have been dissevered and offset by displacement (faulting) along some of the bands of the other set which have not been broken or offset. This relationship tells us two things: the faulted blue bands are an older set, and newer blue bands have formed along the planes of faulting. One may note also that the later blue bands are sharply defined whereas the older structures are less and less distinct in proportion to their age.

There seem to be several possible ways in which these blue bands may originate. Where shearing has developed a distinct fracture, heat from the friction of ice being shoved along the fracture surface may cause local melting followed by freezing of the friction water. This shoving takes place intermittently. If at times the fracture is not entirely tight, melt-water from the glacier surface may penetrate and freeze along it. In either case the fault fracture becomes healed and there are few bubbles of air in the band of new ice which is clear and gives a bluish color. Under certain temperature conditions, the ice crystals in a zone of compressive shearing may be sliced or fragmented (development of cataclastic structure). The friction water refreezing rebuilds the crystals, healing the fractures, but without including the air liberated in the earlier part of the process. Another factor probably also operates to produce banding during the deformation. Unbalanced pressure (differential stress) lowers the melting point of solid substances. The shearing planes are planes of maximum tangential strain along which much energy is expended in the deformation. One might well expect strain melting along these planes during times of deformation, alternating with regelation upon relaxation. By an exceptional amount of alternate melting and refreezing in the zones where greatest yielding takes place the air bubbles are eliminated from them, developing bands of bluish, transparent ice, while at the same time there is more growth of granules in these bands than elsewhere, which checks with observations.

These bits of glacier behavior all tell us something about how a glacier moves. But in spite of all the studies which have been made, we do not yet know precisely how this movement takes place. The real difficulty is that the movement is accomplished, not by a single simple process, but by several processes acting together. The problem is complex. Although the various processes and factors are already fairly well understood individually, just what contribution each makes to the whole phenomenon of glacier motion has not been satisfactorily determined. Indeed the relative importance of the contributing processes probably varies under different conditions of temperature, pressure, stress, and other variables. The controversies over glacier motion have arisen, just as most scientific controversies arise, because one man, or one group, finds that a certain process is in operation and, enthusing over that and ignoring or minimizing everything else, concludes that this gives the whole explanation, whereas another investigator equally impressed by some other process which is known to operate, believes that this process is the whole story. Nature, however, is not so simple in many things, of which glacier motion is one.

In the névé the individual granule, or ice crystal, is the fundamental unit of movement. In general the larger granules grow at the expense of the smaller ones of sharper curvature, or of those less favorably placed. Thus the granules change their positions with respect to one another. They settle in compaction of the mass and creep downhill. As the névé is only partially consolidated and the ice crystals are not tightly locked together, the latter have considerable freedom of movement by slow rotation or moving past one another in an adjustment to space requirements under ever-acting gravity. By innumerable small adjustments between the granules, or small aggregates of granules, the whole mass moves slowly in the direction of least resistance, which is downhill.

As the névé passes into true glacier ice the granules become more firmly interlocked and their individual movements restricted and more difficult. Nevertheless, in a substance as easily deformed as glacier ice near its melting point, the granules should continue to move to some extent with respect to their neighbors even in the lower glacier.

Particularly should this behavior be expected when we call to mind the fact that special mechanical properties are exhibited at

intergranular boundaries. In metals near the melting point, the boundaries between grains are surfaces of weakness compared with any planes within the grains.[4] The same has been found true of pond ice under shearing stress. Deeley has suggested that the molecules at the intercrystal boundaries are in an abnormal state of strain, the crystal lattice being distorted, and that these molecules, therefore, are more easily brought into the liquid relationship than those in the interior of the crystal.

Closely related is the process of molecular transfer by which molecules move from positions of greater stress to positions of less stress. Differential stress, which lowers the melting point and favors melting, is greatest at these points of contact between granules which offer most resistance to shifting of the granules. Molecules therefore tend to migrate from these points of special resistance to places where they offer less resistance, thereby facilitating adjustments between the granules.

Other investigators have appealed to a very thin film of brine between the crystals to explain the observation that glacier ice in the sun melts more readily at intergranular boundaries than within the granules. A certain amount of ocean salt is brought to the glaciers by winds and rainfall. The quantity is very small, but such salt would be excluded from growing ice crystals and would tend to concentrate between them. If, in reality, there should be enough salt along the contacts of the glacier granules it would, by its solution effect, obviously aid movement between the individual grains. That there is sufficient salt to have an important effect, however, has not been proven. But in any case there is the familiar fact that the surface of a glacier after considerable melting under a hot sun crumbles readily into its constituent granules (Fig. 5).

So it is believed by many that small adjustments between the innumerable granules play an important part in the downhill passage of the lower glacier, as they unquestionably do in the névé. It has been computed that the mean motion of the average granule relative to its neighbor need be very slow indeed to account for the glacier velocities which are observed. A glacier moving in such fashion obviously can mold itself to fit the irregularities of its valley, undergo

[4] L. Hawkes, "Some Notes on the Structure and Flow of Ice"; *Geol. Mag.*, lxvii (1930), 111.

bending, and yet maintain the integrity of its granules and the observed crystalline properties at all times.

Another mechanism which is coming to be better understood from researches on the deformation of various crystals and metals (aggregates of small crystals) is minute slip along certain planes within the crystals. A crystal may be bent because a slight amount of slip can occur relatively easily along certain internal crystallographic planes without rupture. This is a process of slicing on a very minute scale and it gives the crystal some degree of plasticity. A crystal of ice is made up of thin laminæ at right angles to the optic axis. Between these are the well-known gliding planes along which the laminæ can slide easily over one another without distortion of the lattice structure of the crystal or loss of cohesion. Yielding along the gliding planes of favorably oriented ice crystals may thus be a factor in the mass movement of glaciers.

F. D. Adams, using high differential pressures, compressed cylinders of marble and other crystalline rocks into quite a different shape by "rock flowage." Some recrystallization occurred, but there was also much shattering of the individual crystals whereby the strength of the rock was considerably reduced although it held firmly together. The slower the deformation, the less the reduction in strength. Allowed to "rest" for a few days the marble partially recovered its strength. From Tarr and von Engeln's experiments we know that when a block of ice is made to change its shape notably by strong compression, individual ice crystals are fragmented into many angular pieces with different orientations and yet the mass remains coherent throughout. The deformed ice is coherent because the process of regelation, emphasized by Tyndall, promptly heals the fractures.

There is, therefore, abundant evidence that ice, if subjected to sufficient differential stress, will change its shape, "flowing" in the direction of least stress by either sliding along gliding planes in its crystals, or by fragmentation of the crystals with differential displacement of the fragments and regelation, or partly by one process and partly by the other. A glacier moving by the summation of small slips *within* its granules, like the glacier moving by the summation of small adjustments *between* the granules already discussed, would change in shape to fit its valley and yet be a

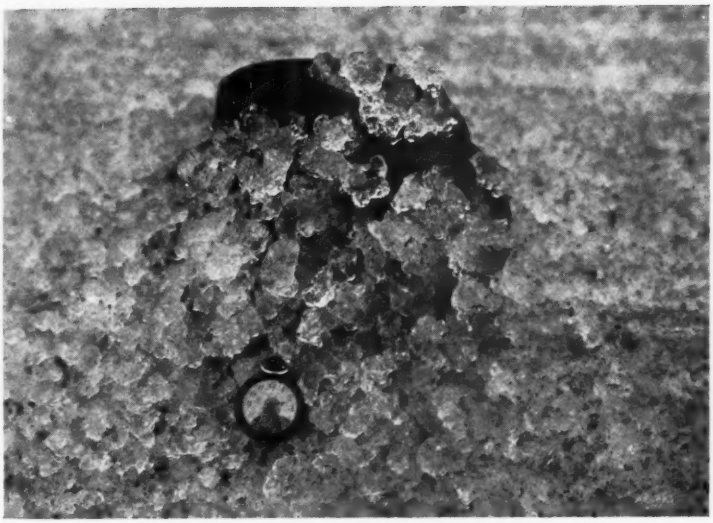


FIG. 5. ICE GRANULES OF KIWA GLACIER, CARIBOO RANGE, B. C.
Granules piled upon hat to show size

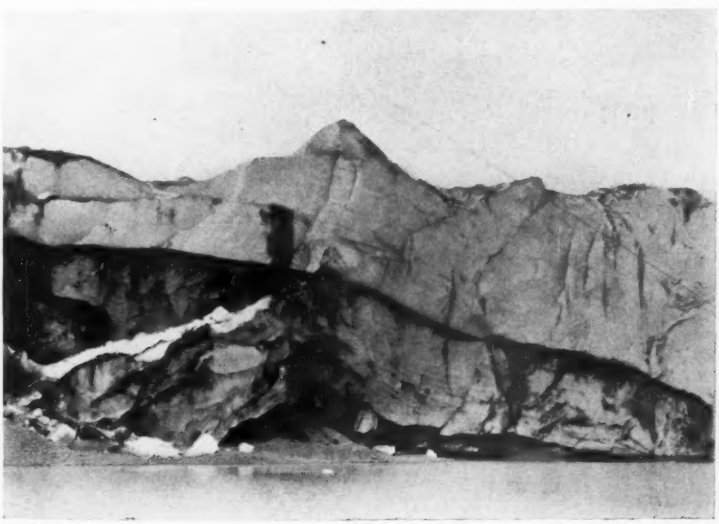


FIG. 6. PROMINENT SHEARING PLANE ON FRONT OF SHOUP GLACIER, ALASKA

Photos, R. T. Chamberlin

FIG. 7. OBLIQUE UPWARD THRUSTS WITH FOLDING OF SLICES
Side of Bowdoin Glacier, North Greenland

FIG. 8. INTERNAL DISTORTION OF SLICES IN BOWDOIN GLACIER
Photos, T. C. Chamberlin

coherent crystalline mass. It cannot, however, be emphasized too strongly that these two processes are not mutually exclusive. There may well be slip within some of the granules as well as slip between some of them. The real question is the relative importance of the two methods of yielding. In this the temperature must be a factor; intergranular melting will facilitate adjustments between granules; in very cold glaciers fracturing must increase in importance relatively, whether this be between granules, within granules, or in major fault planes extending for long distances across the glacier. There is presumably also some difference between the behavior of ice near the surface of a glacier and that deep down beneath a heavy overburden.

In addition to the general pervasive movement of the types already considered, there is also local concentration of movement along many prominent shear planes (Fig. 6). On some the displacement is slight, but others are striking thrust faults on whose surfaces the overriding ice has been shoved forward for considerable distances. Where there is a succession of these well-developed faults, one above another, the ice has fractured into a succession of slices which have been driven forward by the thrust from behind, each slice sliding over the one below. This slice thrusting involves large masses of ice; it is slip on a large scale. Some of the slices show also much internal distortion. Lines of older structures, made conspicuous by dirt accumulated along them, have been bent sharply into overturned folds not unlike the folded rock strata commonly seen in mountain peaks (Figs. 7 and 8). In fact, there is no great difference in kind between faulting and folding in a glacier and the folding and faulting of the deforming earth crust which has produced many of the great mountain ranges of the globe, though mountain masses are pushed up and glaciers move downhill. Glacier ice is in every respect a crystalline rock and it deforms as such. Its notable peculiarity is in being at, or not far below, the melting point.

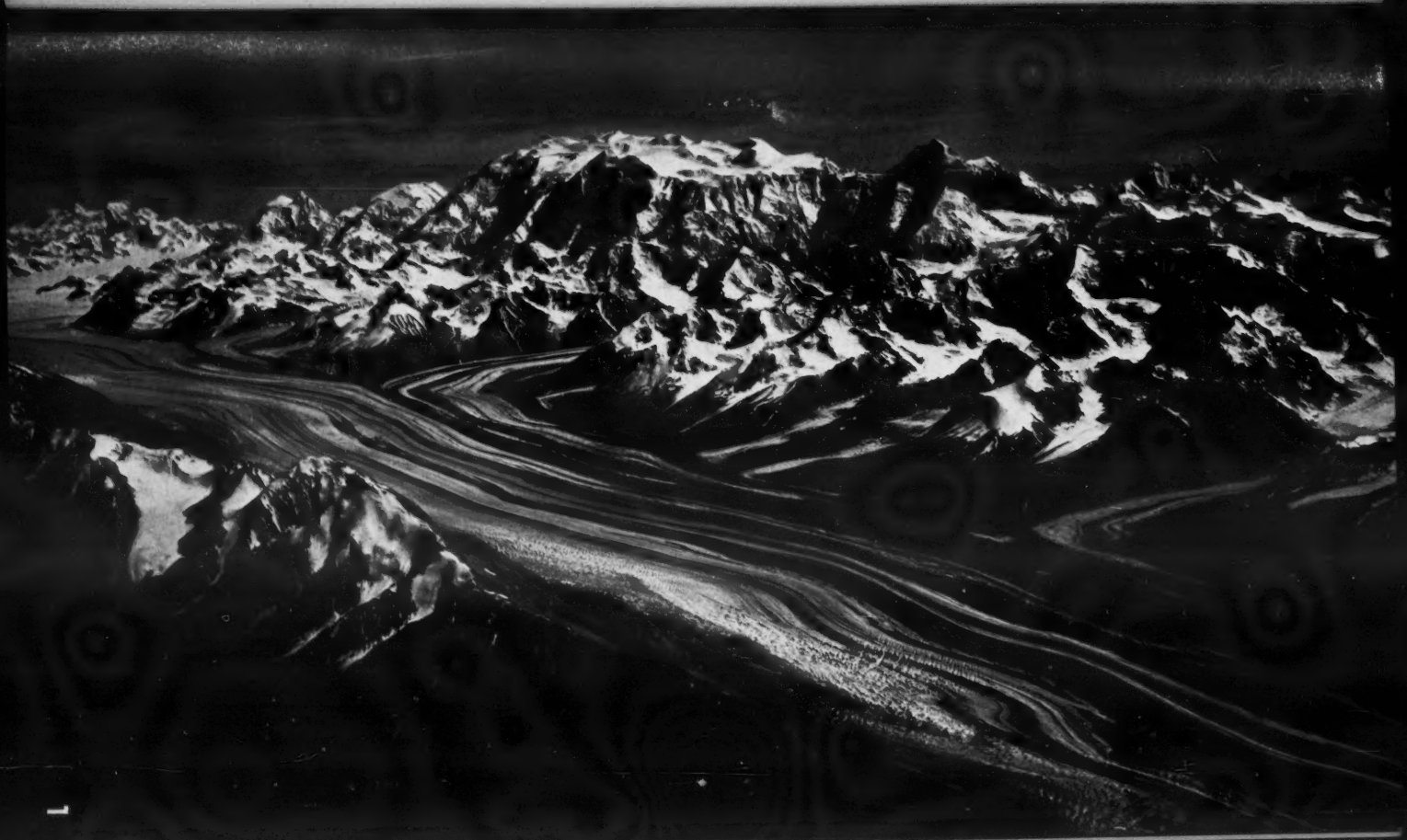
Probably enough has been said to give some idea of the different processes involved in glacier motion. Much more investigation will be needed to evaluate them properly. More measurements to show just how glacier velocity varies with air temperature, amount of sunlight, heavy rains and time of day, like those of Washburn

and Goldthwaite[5] on the South Crillon Glacier in Alaska, may establish facts bearing significantly on the methods of motion. Not only was the movement of the surface of the Crillon Glacier found to be jerky, but especially rapid motion was recorded at three and usually four periods each day. These were shortly after midnight, about 7 A.M., 2 P.M., and again in the early evening. No explanation was offered, but possibly it means a rough six-hour rhythm, irrespective of day and night. Three of the four periods (which we may note were when the glacier surface was cold) occurred consistently; the early afternoon advance (when the sun's effect was most felt) was more irregular and sometimes entirely absent. Measurements should be made on other glaciers for confirmation and comparison. Another promising line of attack is the systematic crystallographic study of the glacier crystals recently started by the Jungfraujoch Research Expedition to discover, among other things, to what extent and under what conditions the crystals show a preferred orientation. Their results are awaited with interest. Odell urges that no opportunity be missed by climbing parties in the higher Himalaya to note the characteristic features and any peculiar behavior of the glaciers in this environment where melt-water plays a minimum rôle in the glacier mechanism. Mountaineers who are interested might try their hand at a study of bergschrunds. So far these have escaped much of the critical scrutiny given to the lower ice tongues, readily reached without the expenditure of much muscular effort, although they have been commonly regarded as a feature of much significance. Glaciers thus still present plenty of problems only partly solved. As the possibilities of working out new climbing routes become increasingly limited among the better-known mountains, the mountaineer may still find opportunities to use his powers of observation to good advantage on the glaciers.

Note.—Through the courtesy of Mr. H. Bradford Washburn, Jr., we are presenting a unique group of the National Geographic Alaska photographs of glaciers, as follows:

1. Mt. Logan and King Peak seen across the Logan Glacier. This glacier has some of the finest medial moraines in Alaska.

[5] Bradford Washburn and Richard Goldthwaite, "Movement of South Crillon Glacier, Alaska"; *Bull. Geol. Soc. Amer.*, 48 (1937), 1653.



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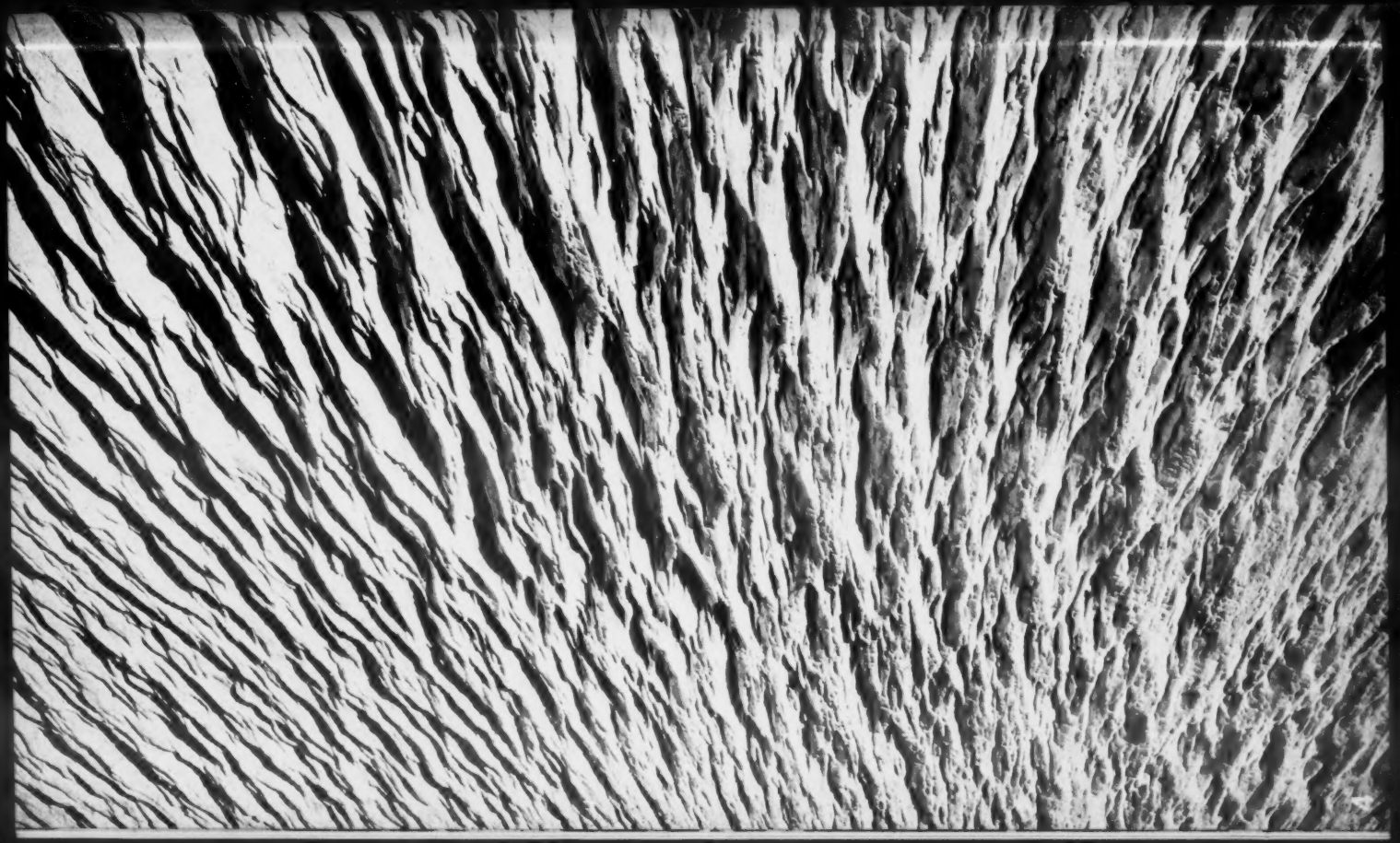

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2. A beautiful series of recessional moraines marking the retreat of the snout of Iliamna Glacier.
3. Fascinating crevasse patterns in the snout of Miles Glacier where it plunges into Miles Lake, near Cordova.
4. The heavy crevassed surface of Sheridan Glacier showing the fanning out of the crevasse system as this glacier spreads out over the coastal plane near Cordova.
5. The Nunatak Glacier in Yakutat Bay. This glacier has receded more than eight miles since 1909, and its present ice front occupies a point which was buried beneath 2000 ft. of ice thirty years ago. The retreat of this glacier is one of the most remarkable records in the annals of glaciation.
6. The Barnard Glacier with Mt. Natazhat in the left background, and Mt. Bear in the upper right corner. The medial moraine system of this glacier is one of the most beautiful that has ever been recorded.
7. Vertical photograph of contorted medial moraines on the Bering Glacier. This curious morainic deformation takes place as a result of variations in the speed and volume of flow of the tributary glaciers from a main trunk glacier.
8. Magnificent contorted medial moraines between Steller Glacier (left) and the main mass of the Bering Glacier (right) seen from 15,000 ft.
9. The stagnant pitted snout of the Woodworth Glacier in the Tasnuna Valley, illustrating the way in which a completely dead mass of ice may slowly melt itself away from the terminus of a receding glacier and then slowly disintegrate. The scale in this photograph is enormous—about 500 ft. to an inch.
10. A beautiful example of an esker and striations beyond the snout of Woodworth Glacier. The dormant portion of the glacier shown vertically in No. 9 is in the upper left-hand corner, whereas in the upper right-hand corner, although the glacier has receded, it still seems to be quite active. Note the alluvial fan at the end of the esker which marks the terminus of the glacier at the time the esker was formed. I am certain from discussions with geologists that this is the only photograph in existence of an esker connected to an active glacier. Most eskers that have been found are features of the Pleistocene glaciation.

Shiprock

BESTOR ROBINSON

RISING out of the Navajo country in northwestern New Mexico is a 2000-ft. volcanic plug of tuff-breccia shot through with a few basalt dikes. This is Shiprock. According to Navajo legend it has been ascended twice. It was, they say, originally a great bird, which carried their ancestors on its back from an inhospitable northern land into the plains of the San Juan, where they now reside. This was the first ascent. The second was by one of their twin gods, for the purpose of slaying a man-eating winged dragon which made its nest in the huge summit bowl.

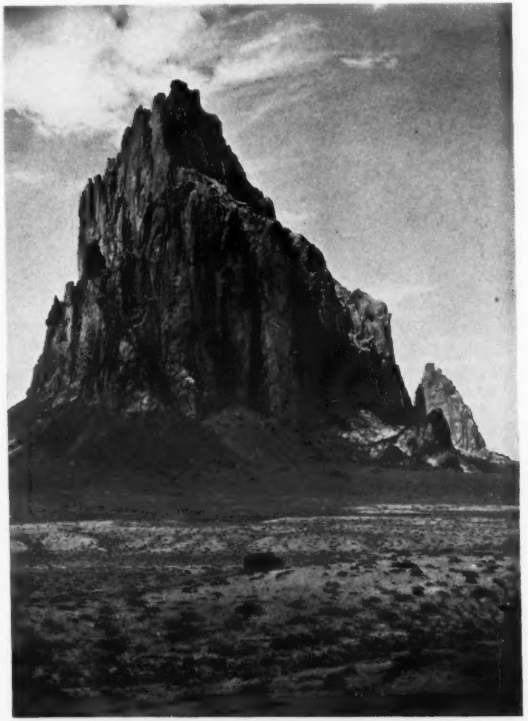
The third ascent was made on October 12th, 1939, by a Sierra Club party, consisting of David Brower, John Dyer, Raffi Bedayan and the writer. The records indicate it was the thirteenth attempt by white men. Perhaps it was the magic of numbers, coupled with the fact that the ascent was made on the four hundred and forty-seventh anniversary of Columbus' discovery of the new world, that broke the mystic spell with which the Navajo gods had defended their mountain home.

Viewed from the prosaic standpoint of technical mountaineering the ascent presented three problems. First was to gain the summit ridge. This had already been done by the Colorado group by way of the N. W. basalt dike.[1] We merely followed their route to the scene of Orme's spectacular fall.

The second problem was to get over, around or through the perpendicular transverse fin which sat astride the main ridge, separating us from the summit tower. The Coloradoans had tried to go over it. A full day of telescope reconnaissance had convinced us of the possibility of a traverse low on the eastern side. So we roped down a long steep chimney, leaving ropes for return hoisting and spent two days ferreting out the minute finger-holds that finally evolved into a route onto a shelf just below the summit bowl.

A double overhang lay between us and the bowl. It was obvious that two days of continuous climbing would be necessary to complete the intricate route. Accordingly, our third and fourth

[1] 'A Bent Piece of Iron,' *Saturday Evening Post*, July 22nd, 1939.



SHIPROCK

CLIFFS OF SHIPROCK

Photos, B. Washburn, Jr.

1 2

SHIPROCK FROM THE E.
1—Summit. 2—The Fin.

THE FIN FROM THE SUMMIT BOWL
Photos, B. Robinson

days, with the intervening night, were spent on the mountain, the night in the summit bowl itself in the legendary nest of the winged dragon.

The summit bowl was achieved by using pitons on a double overhang connected by a delicate friction traverse. On the summit tower an attempt by way of the N. ridge ended under an overhang 75 ft. from the top. The S. ridge begrudgingly yielded a piton route to the actual summit.

The climb was possible only because of the varying capabilities and everlasting teamwork of the party. Brower was the human fly, who could stick to slight discolorations on the rock and balance on narrow ledges. Dyer was the chipmunk, light of weight and capable of squirming up any crack. Bedayan was the powerful anchor man, who gave to the others the assurance that any fall could be successfully held.

The equipment also did its share. Eleven hundred feet of rope and all of it needed; 54 pitons, fully half of them used for direct aid on otherwise unclimbable overhangs; and finally, four anchor bolts used only for safety where inadequacy of stance and lack of piton cracks would otherwise have plunged the entire party to their deaths in case of a fall.

I'm a rock engineer and proud of it. I climb mountains for the same reason that the purists do, because of the sheer joy of accomplishing the difficult. To use pitons for direct aid on a pitch that can be climbed without is to destroy the difficulty that is the basis of the sport. But show me the man who has hung over space suspended by a chest loop from a piton, meanwhile searching for a narrow crack that will admit another, all the while squirming into a position that will enable him to swing the pesky hammer and trying not to get tangled in his ropes—show me such a man who has led real overhangs on pitons which *he* has put in and you will find an enthusiast for rock engineering who will tell you that such a job is more difficult than climbing a Mummery crack.

And how about No. 2 man, the belayer? Is it not more difficult and does it not require more knowledge of technique to handle two ropes with the proper amount of alternating tension than to idly pay out a single rope over either the body or a belay point?

I can understand why those who have no love of gear, of tools and of gadgets, who in short are not mechanically minded,

can find no joy in rock engineering. The maze of ropes will confuse them, the hammering of pitons will annoy them and the leaving of an occasional unremovable piton in the mountain side will offend their overdeveloped aesthetic sensibilities.

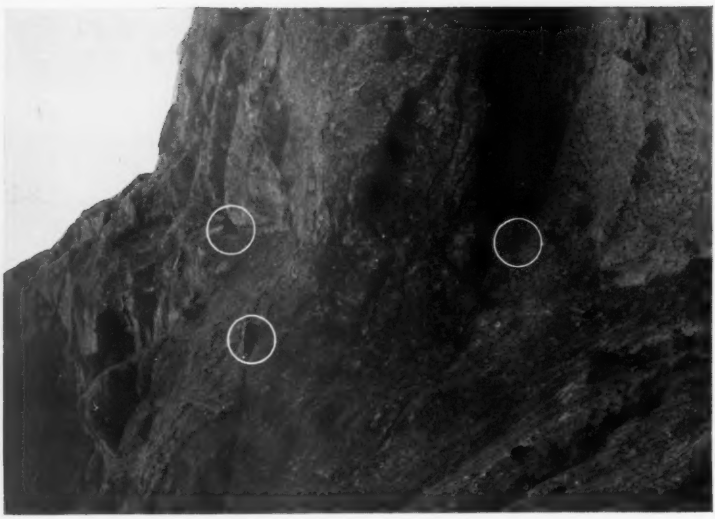
I do not begrudge them the right to climb mountains their own way if they get more joy out of it. But I do protest against these purists attempting to enforce their personal predilections upon the other members of the climbing fraternity and upturning noses of self-righteous scorn upon those who do not agree. The Puritans, it is said, "came to America to worship God as they pleased and see that no one else did the same." The mountaineering purists have followed in their intellectual footsteps.

Let us be tolerant of differences in taste. Let us drop this childish prattle about the immorality of artificial aides. If some climbers really wish to eschew all artificial aides, let them abandon ropes and shoes for surely these are products of a mechanized society. Let them establish a "Nudist Climbing Club" if that is the way they enjoy climbing, and let the rest of us who like our gear and gadgets be tolerant of them so long as they do not actually interfere with our pleasure in climbing.

SEARCHING FOR A ROUTE ACROSS THE FIN

S. ARÊTE OF SUMMIT TOWER

Photos, B. Robinson



TRAVERSE AROUND THE FIN

Photo, B. Robinson

SUMMIT OF SHIPROCK

Left to right: Brower, Bedayan, Robinson

Photo, J. Dyer

First Ascent of the Titcomb Needles

ORRIN H. BONNEY

IN the western part of Wyoming, almost midway between the N. and S. boundary lines of the state, lies one of the most spectacular alpine wonderlands of the United States—the Wind River Range.

In this majestic region of past and present glaciers, the snows of many winters have formed themselves into large icefields, hundreds of feet thick; and high steep-walled peaks, scarcely ever trod by human foot, reach toward a blue sky filled with fleecy clouds; avalanches, seldom heard by human ears or seen by human eyes, roar down the steep slopes; while afternoon torrents rush from the melting snows to the emerald lakes below. These are the headwaters of the mighty Colorado River, the same stream that a thousand miles away has carved itself deep into the Grand Canyon.

By the summer of 1939 practically all of the great peaks of the Wind River Range, except the Titcomb Needles, had been climbed.[1] Though not the first, we ourselves had already attained the summits of Gannett, Warren, Dinwoody, and Mt. Helen, and two of the party had successfully climbed Mt. Woodrow Wilson. Our greatest adventure had been when we made the *first ascent* of the N. E. face of Mt. Warren, approaching near calamity when a large section of that face had treacherously peeled away with the leader. But those adventures are another story.

On July 17, 1939, the three of us, Notsie Garnick and Frank Garnick of Rock Springs, Wyoming, and Orrin H. Bonney, of Houston, Texas, left Pinedale, Wyoming, and on foot led our pack horses 18 miles over the route of the old Shoshone Indian trail to Island Lake, then through the unbroken wilderness 6 miles farther, a total of 24 miles, to our base camp at the head of the Titcomb Lakes. We were joined by Adolph and Rudolph Dobnick who came up from Island Lake, and two days later the five of us left our base camp at 6.30 A.M., for the Great Needle which lies at the N. end of the group.

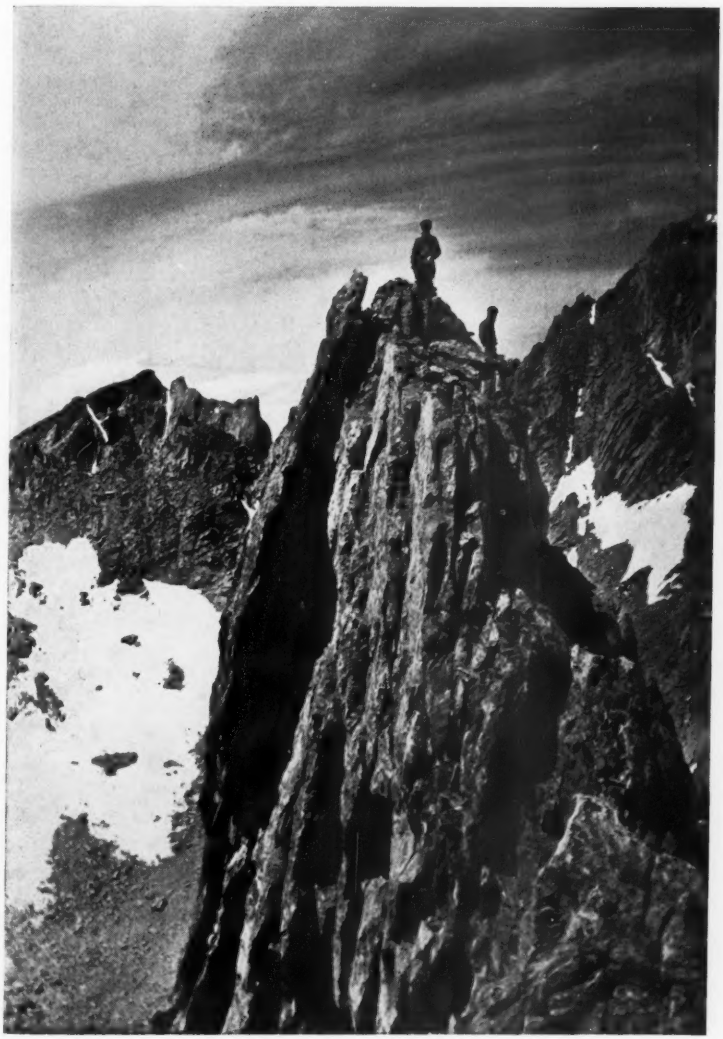
[1] For climbing history of the Wind River Range see *Appalachia,* December. 1932, 204; June, 1933, 354; December, 1938, 233.

Turning westward across the valley about three-fourths of a mile above the upper Titcomb Lake, we proceeded upward to the shelf in which lies Summer-Ice Lake, so named by us because of the large bergs which always remain in it late in the summer. On this particular morning the lake was completely frozen over. Rudolph chopped a hole in the ice with his ice-axe and each of us in turn stretched out and took a drink of the clear, cold water. We circled the lake to the S. and W., gradually gaining altitude upward on the frozen snow slopes. We found much more snow than at any previous summer trip into the Wind River Range, and were able to kick steps most of the way until we reached the higher slopes. From the upper snow slopes we reached a lateral ridge lying S. W. from the lake and running out from the foot of the E. ridge of the Great Needle.

From the valley as I studied the Needles through the binoculars, I had wondered if the Great Needle would be attainable at all. But here, directly beneath the broken surface of the S. E. face, foreshortened as it was, it looked much easier than it later proved to be. In fact it looked so feasible that we then and there abandoned our original plan to cross through the notch and attack it from the W., and decided to proceed directly up the face. I could trace the slight lines of a fault which led westwardly about two-thirds of the way across the lower part of the face, where it was crossed by another fault, turning back to a point near the geometrical center of the face, so we followed this route, hoping that we would discover another line of breakage when we reached this center.

Easy going disappeared with the fault line, and it became necessary to rope up. Frank thought we should turn right at this point, and I thought we should turn left. I roped in second and let him take the lead so that he might work out his route of ascent. It was a wise decision. Two hundred miles a day on the Pinedale mail route had put him in better physical condition than any of the rest of us, and the technique of climbing he had learned on at least three previous expeditions with us was well applied.

It was not long until we were involved in a real tussle with the mountain. As Frank went up a perpendicular stretch, the holds seemed to disappear. His finger tips held by friction, but his boot nails scraped vainly without taking grip. He came back



THE NORTH PRONG OF THE TRIDENT
First ascent July 21, 1939

Photo, O. T. Bonney

MT. HELEN FROM THE GREAT SNOWFIELD ON THE E.
The ascent followed the snow couloir to the right of the main summit

WIND RIVER RANGE FROM TITCOMB BASIN
Titcomb Needles at extreme left

Photos, O. T. Bonney

down to a stance and rested; then tackled it again. It was not possible for me to give him any great amount of aid. With muscles tense and straining, and with boot nails scraping and sliding, he gained a higher finger hold, and with grim determination pulled himself up, gained another hold and brought himself to a point where he had a secure foothold underneath an overhang. Our 120-ft. rope was not enough for a five-man party on this sort of climbing, so while Frank rested for a minute, I stepped out[2] of the rope and added my 30 ft. to Notsie's 25, so that Frank could tackle the overhang. Stretching himself on tiptoe and reaching above the overhang in what at first seemed a fruitless search for another hold, he at last found a small depression, packed hard with gravel. Frank dug out the gravel with his fingers, took a firmer grip, and soon was out of sight above the overhang.

Notsie went next, then unroped and passed his rope down to me. And we in turn brought the other two up. Upward and onward we went, changing ropes now and then in the more difficult passages.

Near the top an overhanging boulder stopped us. Notsie, being the smallest of the five, disappeared underneath the boulder, and squirming somehow managed to get through a marmot-sized hole and above the boulder. None of the rest of us could do it, so Notsie swung the rope over and to the right of the boulder and we all came up in more human fashion. Fifteen feet from the top we all crawled through another hole. We gave Frank the honor of being first on top and then we all went up, took pictures and made two cairns, putting our names in tin cans in both of them.

Descending we turned N. along the ridge for some distance until we were about halfway between the summit and the col to the N., then descended the W. wall of the ridge to a point just above where a couloir reaches the center, then turned southward up a ledge which led directly to the notch or col on the S. side of the Great Needle. This route of descent was my originally projected means of approach to the summit and appears to be the easiest of the routes to the summit.

[2] This procedure is not to be recommended. It takes additional time and, through some slight misunderstanding in the handling of the rope, a man could be easily thrown off balance when getting in and out of the rope. It would have been better to have suffered the weight of an extra rope in the pack.

From the notch we glissaded for several miles over the snowfields to Summer-Ice Lake. Notsie and I loitered to photograph the falls and wild flowers. The others were back at camp two hours after leaving the summit, whereas the ascent had taken six hours—such is the wonder of fast glissading over soft afternoon snow.

Two days later we climbed all three prongs of The Trident[3] (the central group of the Needles) and The Thimble (the southernmost of the sharp summits). That again is another story too long to encompass within these few pages.

And the rest of you mountaineers! Go to the Wind River Range some time. You will find plenty of excitement there.

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[3] Starting as we had on the previous climb we turned S. below the bench on the W. side of the valley then climbed up to it opposite The Trident, crossed over to the col N. of The Thimble and went up the S. ridge of The Trident to its S. prong; then we descended a short distance, turned the S. prong to the W., crossed to the E. and then traversed the ridge to the middle prong; then continued northward along the ridge. After straddling a knife-edge for a short distance, we turned right a foot or two and followed ledge and footholds up the final 40 or 50 ft. Roping down a short way and then proceeding alone back to the middle prong, I photographed Notsie and Frank on the N. prong. We climbed The Thimble with ease from the col N. of it, going directly up from the col and turning slightly left so as to approach the final 30 ft. from the E. Descending from the saddle, we crossed to the snowfields and took another fast ride down to Summer-Ice Lake. The names: *The Great Needle, The Trident* (with its S., middle and N. prongs), *The Thimble,* as well as the name *Summer-Ice Lake,* are the names we have given and are not yet official.

A Month in the Coast Range

STERLING B. HENDRICKS

ACCOUNTS of exploration and climbing in the Coast Range of British Columbia[1] have always stirred me to what I thought was the futile desire to climb there, time and distance being what they are. Opportunity, in the rather solid shape of Henry Hall, however, really knocked this year, and at 1.30 A.M. on June 21st, I unlimbered my stiff joints and stepped down beside Hall, Rex Gibson and Hans Fuhrer. We were at Graham's ranch on Tatla Lake, close up under the mountains and near the end of automobile travel. Later in the morning we drove the 15 miles to Bluff Lake, where Pete McCormick, who had made a preliminary trip, was waiting with George Van and Baptiste Destor, all of Klinaklini. Fourteen horses were standing around, which for Gibson and myself spelled luxury after years of back packing.

Our objective was the group of high mountains around Mt. Waddington and the approach was to be made along the Homathko River and Scimitar Creek by the way that Hall had found. After several years of preliminary exploration, he had reached the heart of the range in 1933, and with Hans, the Mundays and A. E. Roovers had climbed Mt. Combatant (*ca.* 12,400 ft.), the third highest peak of the region.[2] Pete McCormick in the spring of 1934 had packed Sir Norman Watson's outfit along the same route preliminary to the first crossing of the range on skis to Knight Inlet by Watson, Beauman and Camille Couttet.[3] In these trips, Pete and the parties had done much to make and improve the "trail" which most packers would have refused to travel.

After five days of battling with rock slides and water in all of its forms, we reached the camp at the entrance to the Scimitar Creek canyon. Clouds were low and the preceding long period of wet weather had made it necessary on the way in to raft supplies

[1] The names of mountains, glaciers and icefalls used in this article are taken from W. A. D. Munday's map of the Waddington region (*C. A. J.*, xxii, 53). General map showing approaches will be found in *A. A. J.*, ii, 88 and *C. A. J.*, xxi, 108. For a general article on the Coast Range, see *A. J.*, *47*, 288.

[2] *A. A. J.*, ii, 156; *C. A. J.*, xxii, 1.

[3] *Round Mystery Mountain*, by Sir Norman Watson and E. J. King.

across Twist Lake, as well as the lower crossing of the Homathko. The trail up Scimitar Creek that the 1933 party had spent a week in preparing was still in good shape, according to the standards that Pete was willing to put up with, and only one day was required to establish base camp (3200 ft.) near the tongue of the Scimitar Glacier. In the late evening a mountain goat, slightly aided by Baptiste and Hans, delivered himself to the cooking pot.

On the morning of the 27th, Baptiste and George started the return journey for a second load of supplies. While Hall and Hans busied themselves in the neighborhood of camp, Gibson and I set off up Scimitar Glacier to take a look at what the Mundays had named Radiant Icefall, which descends from the basin below Tiedemann, Asperity and Serra, the high peaks of the region. We passed the icefall on the true right side, after a bit of step-cutting, and climbed to 7400 ft. above the gathering basin. Then the impossible happened—the clouds gradually lifted and Mt. Tiedemann (*ca.* 12,900 ft.) came out in its full glory. Careful study, however, made it all too apparent that the basin, which had been considered as a possible way of approach, would not be a good place for a climbing camp. All the great peaks, except Tiedemann, were guarded by impossible looking hanging glaciers and vertical granite slabs. The descent, with many a backward look at the unreal landscape of sharp peaks and banked clouds, required three hours.

For some strange reason that I fail to remember, we rested the next day, which was the first one of perfect weather. With Hall and Hans, we set out at 4.30 A.M., June 29th, with the intention of climbing Cataract col, which leads into the head of Tellot Glacier, and the beautiful unnamed granite peak on its N. side (*ca.* 10,500 ft.). From the col (9000 ft.) at 11 A.M. there was a fleeting glimpse of the great icefalls on Mt. Munday across the Tellot and Tiedemann Glaciers. A storm descended about our ears, however, and it was necessary to turn back, even though the goal was near at hand. There was a heavy rain during the night, and the next day was spent around camp eating goat meat and improving the trail up the snout of Scimitar Glacier.

July 1st was partly clear and we hoped that settled weather had arrived at last. The three sturdiest horses including Nigger and Jimmy, who had made the trip six years before, were loaded and taken up Scimitar Glacier. They were really veterans of ice travel,

MT. TIEDEMANN AND THE CHAOS ICEFALL

Photo, S. B. Hendricks

MT. TIEDEMANN AND MT. HICKSON

GRANITE PEAK AT HEAD OF CATARACT GLACIER

Photos, S. B. Hendricks

and brought the loads without incident to the base of a huge flat boulder about 7 miles up the glacier and near the foot of Chaos Icefall, where we had decided to place our climbing camp (5500 ft.). Hans and Gibson helped Pete back to the base camp while Hall and I put up tents on the snow.

Prayers for fair weather went unheeded and the storm really settled down. Here we were in position to climb Mt. Tiedemann, the second highest summit of the range (12,900 ft.) and it could not even be seen. Mt. Geddes (11,200 ft.) another of the peaks that we wished to attempt, came out once or twice during the next five days, but only for fleeting glimpses. Fortunately, the slopes above camp still held enough brush to furnish us with wood for cooking and boughs for the tents. One day we walked up to the site below Fury Gap that Hall and the Mundays had occupied in 1933, but most of the time was spent in sleeping.

The clouds began to lift a bit on July 7th, so while Hall and Fuhrer descended to the main camp for more provisions, Gibson and I set out at the comfortable hour of 9.15 to see if we could get a view of Mt. Waddington. By 12.30 we had climbed to about 8000 ft. and were just below the S. W. glacier on Mt. Hickson (10,800 ft.), which somehow had become our objective. Gibson led the way through crevasses and up steep snow with a breakable crust as the clouds obligingly retreated. The N. E. summit was reached at 4.30 P.M., and then began a battle to decide whether or not the S. E. tower, which could have as easily been the objective, was higher. Gibson said "No," the distance being too great for us to cover, but measurement proved him wrong by ten feet. The method was to establish a perpendicular by the equivalent of a plumb-bob improvised for the occasion, and then while one aimed along an ice-axe shaft trained on the neighboring peak, the other estimated the angle between the shaft and the bob. Departure from a right angle can be estimated with high accuracy.

This decided, we became aware of the great beauty of our surroundings. The basin of Scimitar Glacier was hidden by a mist hanging on the summit, in which the spectre of the Brocken stood out. Mt. Geddes to the N. was enveloped in a heavy storm and clouds were banked over Fury Gap. The mountains of clouds were no match for the mass of Mt. Waddington (13,260 ft.) that was just beginning to come out. By 5 P.M. both summits were clear,

and I, for one who has seen the rock summit edge on, cannot hope for a more startling view. The return to camp down 5000 ft. of snow and ice required about two and a half hours.

The next day was clearing, but we overslept and did not consider it worth while to start for Mt. Tiedemann. July 9th, however, brought perfect weather and all four of us were off for the 7400-ft. climb at 3 A.M. The moon and Jupiter were almost in occulation above Mt. Damocles, an outlier of Mt. Tiedemann, and Tiedemann itself stood out as a snow pyramid above the Chaos Icefall that went up at an average angle of 35°. We climbed the scrubby shoulder at the foot of the icefall and made for the prominent rock buttress to the right of the glacier coming off Damocles. Here at 7100 ft. (4.40 A.M.) we put on crampons and crossed a subsidiary icefall to the rocks on the true right side of the Chaos Icefall. Following up where the ice touched the rock, the base of a prominent ice cliff was reached, which previous inspection had indicated would be the difficult part of the climb. A huge schrund forced us away from the rock and toward the center of the icefall, where a crack led back among some huge blocks of névé. At one point we were fully 75 ft. below the surface of the glacier, and it was only the slimmest of connections that led to the easier slope of the upper icefall. The summit ridge was reached at 1.30 P.M. up steep slopes of powder snow. It proved to be a sharp crest rising at a angle of more than 30°.

As we approached the top along the ridge, all eyes turned toward the summits of Mt. Waddington, where the face of the unbelievable knife-edge top stood out. Most surprising of all was the intense blue black color of the sky, so characteristic of much higher altitudes. The summit was reached at 3 P.M., just twelve hours from camp, and in a few minutes, with the wind blowing a gale and the temperature down to 20°, one tried to take in all the Coast Range; a sea of ice broken only by the deep valley of the Homathko. Tide water could just be seen near the head of Bute Inlet, and mountains on Vancouver Island were barely visible.

The descent was speeded up as much as possible, and there was some wild slithering in gathering darkness near the base of the icefall. On the way up everyone had daintily avoided little crevasses and spoken softly of the hanging seracs. This was all

forgotten as we jumped down and slid over obstacles, pulling each other out of holes. Camp was reached at 10.05 P.M.

July 10th was another cloudless day, but there was no alternative to resting—no one could pull himself out at 2 A.M. for another climb. However, Gibson and I started at 3.00 the next morning for Mt. Geddes, which Hall and Fuhrer had attempted with the Mundays in 1933. Their route followed up the true right side of the Dissension Icefall that descends to the Scimitar Glacier. Near the top we varied it, turning up a side gulley in order to avoid the broken ice at the crest which had caused them so much trouble. This landed us, quite easily, in the upper névé basin of the Parallel Glacier, and breakfast at 6.00 was disturbed only by storm clouds gathering along the summit ridge of Mt. Geddes. By the time the col (8500 ft.) at the head of the glacier and immediately below the true slopes of the mountain was reached, the storm had set in with full strength. We reluctantly turned back and set off down Parallel Glacier towards Pocket Valley, where it had been planned to move camp during the day. Half-way down the clouds suddenly cleared away and the sun came out; however, clouds soon were coming in from the W. and the storm settled down for the day.

A large icefall which completely fills its trough comes into Parallel Glacier on its left side and a fine rock peak can be seen rising on the W. side of the basin above. This we named *Mt. Roovers,* in honor of the late A. E. Roovers, who had accompanied Hall into this region in 1933, and had climbed to within a short distance of the summit of *Mt. Cornelia,* the next mountain to the E.

Gibson said that Parallel Glacier should really have been called Flattery, because it had such a smooth tongue. After dodging around several large moulins which would have been a hazard in the dark, we reached the floor of Pocket Valley, which was thick with mosquitoes and wet slide alder. As there was fortunately no sign of camp, we climbed the moraine and started back up Scimitar Glacier, reaching the climbing camp at 2.35. Hall and Fuhrer had decided to leave and go directly to base camp as the storm settled down, but had left our belongings and a note about the general plans.

July 12th dawned with a threatening sky, but the outlook improved, and Gibson and I set out once again for Mt. Geddes at 5.15 A.M. The col was reached by the same route at 9.05, and for

the first time the long ice-clad wall to the S. of Mt. Bell and immediately to the W. came into view. A cold wind was blowing and the sky was dull, so hopes were none too high. Leaving our crampons, we set off up the rock rib, leading out of the col, and continued along it until forced out on the S. slopes. These were crossed toward the W. over steep firm snow patches and little rock pitches. At 12.15 we stopped for lunch on the S. face, confident that the summit was only an hour away, and wondering where the 1933 party had found difficulties. Snow and ice above were very steep, and we finally took to a rock rib, where I found how difficult the rock climbing of this region can be. The granite is very smooth and free of cracks; at one place all of a 100-ft. rope was out.

The summit ridge was reached near the eastern end and its entire length had to be traversed. Three bad gendarmes were passed by using the exceedingly sheer northern face, which at first sight always seemed the least logical place. In rounding one, again with 100 ft. of rope out, I had the experience of my bare hand, from which the mitten had been removed for rock climbing, freezing to the head of the ice-axe. A last vertical corner of rotten snow was passed with difficulty, and the summit was reached at 5.05 P.M. The scene was as wild as one could imagine, with its dominant features—Mt. Waddington to the S., and Mt. Bell immediately to the W., while Remote Mtn. stood out to the N. W. Again, caution was sacrificed for speed, and by 8.35 we were back in the col. On the way down we roped off one gendarme and cut steps down a snow gulley leaving near the end of the summit ridge. The bottom of the Dissension Icefall, not more than 200 ft. above the Scimitar Glacier, was reached by 10.00 P.M. It was too dark, however, for us to complete the descent through a rock cleft that had been used on the way up, so we sat down to wait for morning. The night was warm, not below freezing, and the sky was perfectly clear. We watched three of the planets wheel across the sky, and saw Mars come up like a bonfire from behind the ridge of Mt. Waddington to the W.

Camp was reached at 5.30 A.M., and after a rest and nap the journey was made to base camp. On July 14th, in rain, camp was moved to the Homathko (2600 ft.). Rain continued for two more days, and thwarted plans for a long exploratory trip to the S. On the 17th, however, all four of us got away with camp equipment on

our backs, and climbed to Bench Glacier above Five Fingered Creek. A suitable campsite (6500 ft.) was reached at 10.00 A.M., and soon after we set out for the col at the head of the valley. Again, the storm gathered and we contented ourselves with crossing the col and gaining a rock ridge (8800 ft.). Mt. Queen Bess (10,700 ft.) to the S. stood out through the changing clouds and two fine peaks well over 10,000 ft. were near at hand. The more prominent of these, which is possibly the highest mountain in the angle of the Homathko forks we named *Mt. Pagoda,* because of its long even summit ridge. We gave up all hope for the weather and returned to base camp at 9.00 P.M., after a total of over 6000 ft. of climbing and 20 miles in distance.

July 18th continued cloudy, so we prepared to leave. Two days took us to a camp above Middle Lake (2900 ft.). The second, July 20th, was clear, and gave wonderful views of the Waddington Group from the shores of Middle Lake. In this camp we had the unusual experience of seeing and hearing in broad daylight a meteorite fall 100 miles to the E. July 21st was still clear, so it was decided to make an attempt on Mt. Whitesaddle (10,050 ft.) immediately to the S. Camp was left at 2 P.M. and horses were used for a mile across the N. margin of Middle Lake to reach the opposite slopes, where packs were shouldered. A bivouac camp was established in a high rocky valley opposite main camp. We left the bivouac at 4.40 A.M. and set out for a prominent snow face on the N. side, which was ascended, although it was very steep and somewhat soft, to the summit, which was reached at 8.50 A.M. For once, time was not pressing, so we sat and gazed at the mountains to the S., W., and N. Mt. Monarch stood high above its neighbors to the N., and the Waddington Group, now 40 miles away, looked like mountains of Fairyland. The bearing on Mt. Pagoda, the S. E. summit of which is the highest, was 135°.

Leaving the summit at 10.45, we raced down the S. W. scree slopes; Mt. Whitesaddle is in the region of contact metamorphism to the E. of the granite massif of the Coast Range, and thus the scree. The bivouac site was reached at 1.00 P.M., and after a stop for lunch we returned to Middle Lake at 4.30, and had an invigorating swim.

Four hours on July 23rd took us to Bluff Lake, where Hodgson was waiting with his car to take us back to Williams Lake. This

was the end of the mountaineering trip, which had lasted 32 days and which was a very happy one, although the weather had been rather bad despite Pete's guarantees. On the way out along the road, we looked back in the hope of seeing the Waddington Group once again, and were rewarded with a distant view of Mt. Hickson from the slopes of Loon Hill. Mt. Waddington might possibly be visible from some nearby point.

It is to be regretted that we failed to add very much to the geographical knowledge of the region, since parts of it are still not clearly known. Hall and Fuhrer climbed the pass leading to the N. E. out of Pocket Valley that they had hoped would lead into some tributary of the Klinaklini Valley. It proved, however, to go into Granite Creek, which swings around in a big arc before entering the Homathko. A very fine group of mountains around 10,000 ft. in height form the N. wall of this valley. The most perplexing feature of the region, and one that we had hoped to straighten out, is the relationship of Mt. Tiedemann to the peaks at the head of Tiedemann and Tellot Glaciers. However, we did not find a suitable approach to these mountains, which might possibly be across Cataract Col, and by the head of Tellot Glacier. Our approach by the way of the slopes above Five Fingered Creek and the Bench Glacier does not take one near the peak that we called Pagoda, although it does place one close to another fine peak, probably 10,000 ft. in height. It might be of final interest to note that the trip from Bluff Lake to Scimitar Creek could probably be made by boat with only a few short portages which would place a party within two days of a climbing camp from which Mts. Asperity, Serra, Tellot, and others could be attempted. All of these peaks are granitic, and some of them are aiguilles that would do more than justice to the region around Chamonix.

The Exploration of the Source of the Thompson River in British Columbia

RAYMOND T. ZILLMER

THE Thompson River in British Columbia rises in the southeastern part of the Cariboo Range. The western side of the Cariboo Range is rather well known, as the discovery of gold brought a large migration of people to exploit it. But the eastern and higher portion is quite unexplored even to this day, except for trappers and prospectors who leave no written record of their work.

The Cariboo Range is important in the development of Canada. When the Canadian Pacific Railway considered the matter of its route across the continental divide, it tentatively selected Yellowhead Pass, for it offered the easiest crossing. But that decision was frustrated by the Cariboo Mountains. A practical railroad route led from Yellowhead Pass to the Fraser River and down the Fraser until the Cariboo Range was reached, about 50 miles west of the pass. Here, from an elevation of 2400 ft., at Tête Jaune Cache, the Cariboo Range rises in a very short distance to as high as 11,750 ft., the height of Mt. Sir Wilfred Laurier, the highest peak of the entire Interior Ranges of British Columbia. If a route could not be found across the range, a long detour to the northwest or to the south was necessary—the routes now followed by the Canadian National Railway. So from 1871 to 1874 four well-equipped expeditions sought a route across the Cariboo Mountains. But they found that only high glacial passes were available. So the route across Yellowhead Pass was abandoned in favor of the more southerly route now used by the Canadian Pacific Railway.

The eastern Cariboos, and from here all reference to the Cariboos will be understood as referring to the eastern portion, were thereafter completely ignored until 1916. From then until 1927 mountaineers were responsible for what we may call the second period of exploration. The controversy arising out of these explorations drew me to the range for the purpose of settling the questions raised during this period.

There were four expeditions from 1916 to 1927, all of them from near Tête Jaune Cache, on the east central side of the Cariboos.

SKETCH MAP OF SOURCES OF THOMPSON, RAUSH AND AZURE RIVERS CARIBOO RANGE
BY RAYMOND T. ZILLMER 1939
DIVIDE
COL
BLACKSTONE GLACIER
BLACKSTONE CREEK
THOMPSON RIVER
THOMPSON GLACIER
SLIGHT DEPRESSION INTO CANYON
HIGH PEAK
LARGE GLACIER
LARGE GLACIER
EAST BRANCH
RAUSH RIVER
SOUTH BRANCH
MEADOW
AZURE RIVER
ELLA FERE CREEK
NORTH BRANCH
SOUTH BRANCH
GLACIER
TRAIL TO HORSE CREEK
TO HORSE CREEK
ICEFIELD
BRAITHWAITE ICEFIELD
A
B
C
D
E
#1
#2
#3
#4
#5
#6
#7
#8

In 1916, E. W. D. Holway and A. J. Gilmour went up Tête (Sand) Creek, but weather prevented important results. In 1924, A. Carpé, R. T. Chamberlin, and A. L. Withers entered by the same route and climbed several high peaks, among them Sir Wilfred Laurier. In 1925, that indefatigable couple, Mr. and Mrs. W. A. D. Munday, who have contributed so much to the exploration of the Coast Range, entered by way of Tête Creek and climbed several high peaks, among them Mt. Thompson. In 1927, Carpé and Chamberlin entered by Kiwa Creek, lying immediately north of Tête Creek, and again climbed several high peaks. The articles (*Canadian Alpine Journal, Alpine Journal, Appalachia*) describing these expeditions resulted in a controversy as to where the Thompson, the Raush and the Canoe Rivers rose in the range.

It was my purpose to travel up the Thompson Valley to its source, explore its source, determine its relation to the Raush, and cross the range, if possible, going out by way of the Canoe River.

My trip in July, 1939, was my seventh back-pack trip in the mountains of Alberta and British Columbia. On two of these trips I went alone, and on the others I was accompanied by another amateur, this year by Lorin Tiefenthaler who had been with me on the Mackenzie Trail the year before. We planned to carry everything in Trapper Nelson packboards, without reprovisioning or help from anyone. Our food was measured out in exact amounts for each meal of the 13 days. We had 2-lb. down sleeping bags, a very small, light tent, no arms, no camp-axe, no change of clothing except socks and underwear—only that which was absolutely necessary. As we planned to make a plane-table survey and cross the icefields, we were burdened with the additional material for the survey, and a primus stove, a gallon of gasoline, and climbing equipment. It was quite a load!

We planned on going up the Thompson River from the point where it leaves the Canadian National Railway at the flag station, Gosnell. The region has not been surveyed. In fact, the only maps that exist are based on sketches made by prospectors or trappers, the best sketch of the upper Thompson being by Angus Horne of Blue River.

I made careful preparations for this trip, studying plane-table surveying, reading everything I could find on the region, and carry-

ing on a considerable correspondence for two years, but there was not much that I could learn in advance of the country.

Walter Moberly, who in 1873 attempted to find a way across the mountains, said: "I . . . . went to the forks of the Albreda and North Thompson River, and up the valley of the latter. . . . I pursued my way until, at a very high elevation, I was surrounded by snow-capped peaks and glaciers that presented an impenetrable wall of rock, snow and ice." But Moberly said that he was "only a few days in there." It is clear from this remark that Moberly could not have gone very far up the Thompson River, certainly not near its source.

In 1874, E. W. Jarvis ascended the Clearwater River and crossed to the upper Thompson River. The Canadian Pacific report states that "the summit of the divide at the lowest point that could be found on this route was an immense glacier 7000 ft. above sea level." It would seem that Mr. Jarvis could not have been near the source of the Thompson River, for there is an easily found non-glacial, under-timberline pass near the source of the Thompson.

Mr. Angus Horne was very kind, helping us in many ways. Long before we reached the mountains, the Pullman conductor gave us a note which had been given to him by another conductor, who, in turn, had received it from Mr. Horne. In this note Mr. Horne, in characteristic mountain fashion, gave us final advice that "the best way to get out of a crevasse is to stay out." He warned us that we were going too early, for the season was delayed and abnormally wet. And he added: "When you get off at Gosnell siding, you may see a Miss Frye who, strange as it may seem, is a trapper and is familiar with the Thompson trail and will be glad to start you off right." It was after six in the evening when we got off the train at Gosnell and there, near the track, were Miss Ella Frye and Malcolm McMillan. They asked us to her cabin nearby. Ella Frye was the licensed trapper of the upper Thompson and its branches. There was much information that we wanted from her, so we postponed our start until the next morning. No one could have been kinder to us than Miss Frye and Malcolm McMillan. She helped us in every way with her knowledge of the valley, but most of all with the mosquito netting which she insisted on our taking, although she had none thereafter for herself. Mosquitoes were to be the worst I have ever experienced, yet the mosquito

netting was the one thing we forgot. As our gasoline can was leaking, she gave us hers, and offered us a rifle which we declined. On the wall of her cabin hung the hide of a grizzly which she had shot a few miles up the trail we were to take the next morning.

We started on the morning of July 3rd, crossing the Albreda River on a large fallen tree to the N. side of the Thompson which we were to follow for 30.5 miles on a rough and, for a large part, thickly overgrown trail to a point where the trail crossed to the other side of the river. It took us four and a quarter days to get to this crossing. It rained much of the time, so that we were always wet, if not from the rain then from the dripping willows, alders, and wild parsnip which we pushed through, and from the nettle and devils club which we walked through cautiously with hands raised high. We were dry only when we crawled into our sleeping bags at night. We made no serious effort to dry our shoes or clothing because within five minutes after starting the next morning, we would be thoroughly soaked again from head to foot. As I wore glasses, I had difficulty seeing, for my glasses were often dripping wet and covered with débris from the bushes we pushed through. We forded many tributaries of the Thompson, and crossed many mud-holes, and marshes, often covered with water.

We lost a day through an injury to the tendons of my left leg. In the late afternoon of the first day the trail led to an area 150 to 200 yards in diameter where several large and many small trees had fallen, cluttering up the entire area with many broken trunks and branches. I was walking on a fallen tree seven or eight feet above the ground, when, suddenly losing my balance, I was compelled to jump. Carrying my heavy pack, I crashed through the débris and undergrowth a foot or so. Not until the next day did I realize that I had hurt the tendons in my left leg. The next few days I suffered, not so much because of the very painful leg, but because of the mental anguish that perhaps I should or must give up the trip. On the fifth day my leg was improved, and I was able to proceed at a faster gait.

When I got up on the morning of the second day I had trouble opening my eyes, and when Lorin looked at me he said: "No wonder, your eyes are almost closed from the mosquito bites."

On the third day, while resting on the trail, I heard a noise in the bushes ahead and, bending forward, saw a large black

bear, perhaps 12-15 ft. away, walking toward me on the trail. I tried to get up, but I could not do so quickly for my arms were in the pack straps and the camera straps were about my neck. So I grabbed my ice-axe and yelled. Lorin, spying him almost at the same time, yelled too. The bear took one more step toward us, looked at us deliberately, and before taking another step, crashed off the trail into the brush. His footprints on the trail were an inch longer than my number ten climbing shoes.

Early on the fifth day we arrived at the crossing of the Thompson. The weather was clearing for the first time. We had gone from about 2500 ft. to the 3450-ft. level, and the valley now, for the first time, gave us an open view of the mountains ahead. We had gone in a westerly direction until the third day, when we swung to the N. W. and, just before arriving at the crossing, we turned N.

We were uncertain what to do at this point. We could cross the river, continue on the trail which went W. and S. W. to the divide between the Azure, a branch of the Clearwater and the Thompson, and then follow the mountain divide N. between the upper Azure and the upper Thompson until we reached the Raush, which flowed N. Carpé and Munday agreed that the sources of the Raush and Thompson were in a common, low pass. By this time, I had come to the conclusion that this probably was not the fact.

We had two other alternatives. One was to climb the mountain E. of where we then stood, by following a ridge alongside and S. of a creek that came into the Thompson a little N. of us, named Blackstone Creek by Miss Frye. Above timberline we would get to a large icefield which fed this creek and which we called Blackstone Glacier. From this icefield we could reach an ice col to the N. of the icefield. This col would take us out of the Thompson drainage and by going, we thought, about due E., we would reach the Canoe River. We determined against this plan because we might not then be able to settle the question of the Raush source.

The third alternative was to go up the bed of the Thompson as far as possible. This was what we did. We walked the stony bars, and forded the ice-cold stream back and forth until our legs were quite numb. But in less than an hour we were blocked by a canyon. How long was the canyon? Was there another canyon?

THOMPSON RIVER NEAR THE FORD

Mountain in middle stands N. of junction of Thompson River and Ella Frye Creek. Glacier overflow is from glacier in Raush drainage.

N. BRANCH ELLA FRYE CREEK LOWER LEFT HAND

Thompson Glacier, source of Thompson River, lower right. High mountains at left.

Photos, L. Tiefenthaler

BRAITHWAITE ICEFIELD
From the N. E., on the Azure-Thompson Divide

AT BOTTOM IS MEADOW IN WHICH AZURE AND RAUSH RISE
Azure from glacier to left, and Raush from glacier to right
Photos, L. Tiefenthaler

We could not tell. The condition of my leg was still too doubtful to do much continuous rock climbing with a heavy pack, so we turned back to take the trail which led to the divide W. of us.

The stream which we had forded with difficulty going up was now much higher, higher even than the level of the water at the ford. And the river at the ford is described in the 1927 Report of the Minister of Mines, referring to crossing it with horses, as "a crossing difficult or impossible at high water." Lorin crossed without much difficulty, but he was six inches taller than I. I had to turn back when I attempted to cross, as my ice-axe did not provide sufficient support. I found a 15-ft. pole and made a second attempt to cross, but the pole was pulled out of my hands, and after a few seconds that seemed hours, I was thrown over on my back, pack and all. The current was so strong, however, that I was very quickly thrown across to the other side of the stream, suffering only a slightly skinned finger, in spite of the many rocks in the river. This experience confirmed my theory that it would be very difficult, if not impossible, to avoid being tossed out by the fast waters, either on one side or the other, of such streams. The movie camera on the outside of my pack was ruined for the trip, but the contents of my pack were dry, and fortunately, we carried a second movie camera.

We decided to camp early at the crossing so as to get much needed rest. The first clear sky and a beautiful sunset seemed to predict the perfect weather which followed just when we needed it most.

The next morning, after caching some supplies, we followed the trail W. and S. W. to the divide between the Azure and the Thompson, and at noon reached the outlet of Summit Lake (5200 ft.) which is practically on the divide. The view of the lake and of the mountains to the S. was the most beautiful on our trip.

As my altimeter contained moisture from pushing through wet bushes, the altitudes hereafter are given with some misgivings.

We went to the middle of the N. shore of the lake. The trees and bushes still formed a dense growth, and the mountain dropped rather quickly into the lake, so we saved considerable time and effort by walking in the water at the edge of the lake, sometimes to a depth of 2 or 3 ft. We cut a tent pole and sticks for our camps above timber. From the lake we went up northerly toward the

divide between the Azure and the Thompson, making altitude quickly, and that evening, about five, we camped beside the last low spruces. The ground was covered with false heather. Everything was oozing water, for the snow had just melted a day or two before and large snow patches were still near us. We carried no ground cloth or air mattress, so we built a 6-inch mattress of heather, and never on the trip did we sleep more comfortably than at "Heather Camp." The view from it was most beautiful—across the lake to the mountains S. of it, E. to the mountains across the Thompson, and W. to the Braithwaite Icefield and mountains. The elevation was 6660 ft.

In the morning, we soon reached a col in the ridge N. of us, beyond which we thought would be a large icefield upon which we could make quick progress N. When we reached the col our disappointment was great, for, instead of an icefield at our level, the ground dropped down steeply to a creek which flows to the N. E. This was the S. branch of the N. W. source of the Thompson. We preferred to name it the S. branch of "Ella Frye Creek."

While our first reaction was disappointment, our second was exhilaration, for in the distance were spectacular and majestic peaks in a ridge perhaps 10,000 ft. high. The entire Thompson watershed extends no farther than the ridge, and toward the left reaches only a subsidiary ridge branching from the principal one. From the moment we reached the col to the time we returned to timber a few days later, we saw breath-taking views that can never be forgotten.

To cross the creek would mean a loss of considerable elevation, so we decided to follow the ridge to the W. until it turned N. around the head of the creek, and then we would go N. until we reached the icefield we saw to the N. And this we did, climbing some of the low peaks on the way. I have numbered these for the purpose of the sketch map.

We climbed those numbered 1, 2, 4 and 8 on the sketch. All of them were mere walks. The ridge that we followed in the next two days, between the Azure and the Thompson, gives outstanding views in every direction, for there are no obstructing mountains anywhere near it. The views unfolded more and more information as we proceeded northward. We climbed No. 1, 7700 ft., and No. 2, 8010 ft., before lunch. From No. 1 we saw that the main

Thompson turns N. E. a short distance north of where Ella Frye Creek comes in. This N. E. source should be considered the main stream, for it is cut much more deeply into the mountains than Ella Frye Creek, and continues as a deeply cut canyon to its very source, where it rises in a long, narrow glacier. The glacier rises very steeply, almost, but not quite, to the divide ridge. There is no col at this point. We saw all this better later. From No. 2 we looked straight down the S. fork of Ella Frye Creek to the place where it joins the N. fork coming from the N. W. Together they flow S. E., and soon join the upper Thompson. The S. fork rises in a glacial pass but the glacier in the pass is shallow. From No. 2 we saw, S. 60° W. (magnetic correction in this locality is 26° 30′), a tremendous icefield, the Braithwaite, immediately W. of the Azure. At least one mountain in it seemed well over 10,000 ft.

As we lunched on the warm, sunny side of No. 2, a mother, father and baby goat crossed the glacial shoulder of No. 3 to the S. W. of us. We were now on glaciers practically all of the time. And Lorin was happy, for at last he was able to unload the gasoline in the primus. After lunch we continued W., passing No. 3 on our left. At 2.30 we saw the Azure below us, although we first thought it was the Raush for it seemed to flow N. Across the valley was the Braithwaite Icefield. We continued N., dropping down into the col at the head of the S. branch and then rose rapidly toward No. 4, staying on the Azure side. Looking back we saw three caribou on the ice we had just left. When we yelled they stood for a long time and looked at us. One of them, over-curious, started walking toward us, but we could not wait.

It took considerable resolution to pass several thick patches of grass on the sunny side of No. 4, but we continued until six o'clock, when we were just below the top of No. 4. We camped on the ridge in talc shale, so well broken as to seem soft, until we slept on it. And the shale was wet for it only recently had been covered with snow. As a strong wind was blowing from the W., we put our tent a few feet E. of the ridge thus getting the protection of the ridge for perhaps a foot. The drop-off to the E. was too steep to get farther below the ridge.

A fine sunset and far-reaching views made this camp at an elevation of 8180 ft. unforgettable. All of the glaciers were entirely covered with snow. To the S. W. the large Braithwaite

Icefield looked more spectacular than ever. With the western sun on its frosted surface, it shimmered like cellophane. To the N. W. were the glaciers just W. of the source of the Azure and the Raush.

Far to the E. was Albreda Peak (10,090 ft.) of the Monashee Range. Thorington's excellent *Climbers' Guide to the Interior Ranges of British Columbia* states that Albreda "is the only important summit in the N. (North Monashee) area visible from the railroad." I believe that at least one, and possibly more, are visible from the railroad. At any rate, from our camp site we could see several mountains S. of Albreda and E. of the Canadian National Railway, which are higher than Albreda.[1] After returning home, I learned that one of them is approximately 10,500 ft. high.

But we did not sleep much. The wind blew hard all night. Fearing that the tent would blow away, we crowded our packs inside our small tent to hold it down, but it continued to rattle noisily and flap against us all night. We were lying on hard, cold, wet stones. We wore knitted caps. But instead of wearing my camel's hair mittens, I placed them carefully below me, and the few square inches did help when one one arranged oneself scientifically on them. When I did sleep, I slept lying on my arms, placed below my back or below my stomach and chest. This created an air space, at least for my body. We were quite glad to get up in the cold morning air.

At 9.30 the next morning we were on top of No. 4, elevation 8950 ft. We could see that our proposed route to the Canoe River over the col near Blackstone Glacier was feasible. From here, we had our best view of the open pass, still in snow, by which one could go from the Azure to Hobson Creek flowing W., and so reach, ultimately, Quesnelle Lake and the Fraser. From this pass the entire Braithwaite Icefield and the large icefield to the N. are easily accessible. The northern icefield feeds the Azure on its S. E., the Raush on its E. and N., and the Hobson on its W.

[1] At least six peaks, one of them the highest of the Monashee Range, exceed Albreda Peak in elevation, valleys heading among them reaching the railroad between Lempriere and Blue River. The range broadens considerably in this area, and it is questionable whether these high summits are visible from the railroad. One would at least require Mr. Zillmer's special knowledge.—*Ed.*

The passes to Hobson Creek, to Summit Lake, and to the Raush, are the only open passes in the upper Azure.

Leaving No. 4, we continued N. on the glacier, but on the Thompson side of the ridge, passing Nos. 5 and 6 on our left. They are probably close to 10,000 ft. high. Time did not permit climbing either of them. We were on a considerable icefield, perhaps three to four miles N. and S., and several miles E. and W. N. of No. 6 the ice reaches in beautiful curves to quite near the top of No. 6. We cached most of our supplies on the icefield near No. 5 and continued N. to a col between two knobs that stuck out above the ice and seemed to give a fine viewpoint. At the col we turned W., reaching knob No. 8, elevation 8460 ft., at 11.40 A.M.

The view from No. 8 settled many questions. Below us, to the N., was the glacial pass and the N. branch of Ella Frye Creek, which rises from it. We knew then that the only sizeable streams at the source of the upper Thompson are Blackstone Creek, Ella Frye Creek, and the main stream ending in Thompson Glacier—all of them having high glacial sources.

To the W., and several thousand feet below us, was a flat meadow (elevation 5250 ft.) in which the Azure and the Raush rise. To the W. of the meadow two large lobes of the glacier come down, the southern lobe feeding the Azure and the northern lobe the Raush.

The Mundays[2] and Carpé[3] determined that there was a low pass between the Raush and the Thompson. The Mundays probably thought that the pass was S. of this meadow. Their picture in the *Canadian Alpine Journal* (xvii, 78) seems to include this meadow, although they assumed it was entirely in the Raush basin. Carpé referred to a "continuous trench" from the Raush to the Thompson.

Returning to our view from No. 8, at the farthest N. was the ridge which is perhaps 10,000 ft. high at many parts, and perhaps 11,000 ft. in the high peaks rising out of or near it. I noted few breaks in this ridge, which extends W. until it turns N. and out of view where the Raush flows N. The ridge extends E., turning slightly S. before the Thompson Glacier is reached. Then

[2] *C. A. J.*, xv, 129.
[3] *Appalachia*, June, 1928, 5.

Introduction to the Bobbie Burns Group

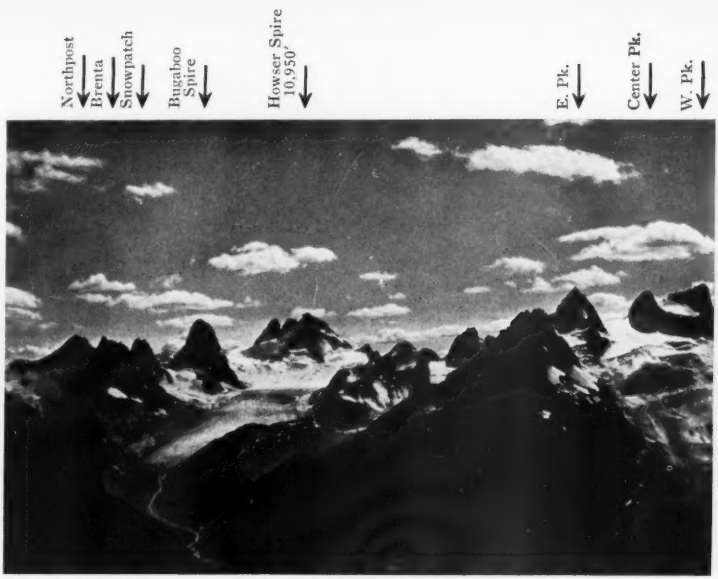
FRANCIS S. NORTH

THERE is nothing dearer to the heart of a mountaineer than a first ascent, especially in a district which has resisted previous attempts. When in the summer of 1938, Georgia Engelhard and I viewed from our summits in the Bugaboos the fine virgin rock peaks in the Bobbie Burns Group[1] to the north, they looked steep, challenging, and definitely attractive. We decided forthwith that it would be our next objective.

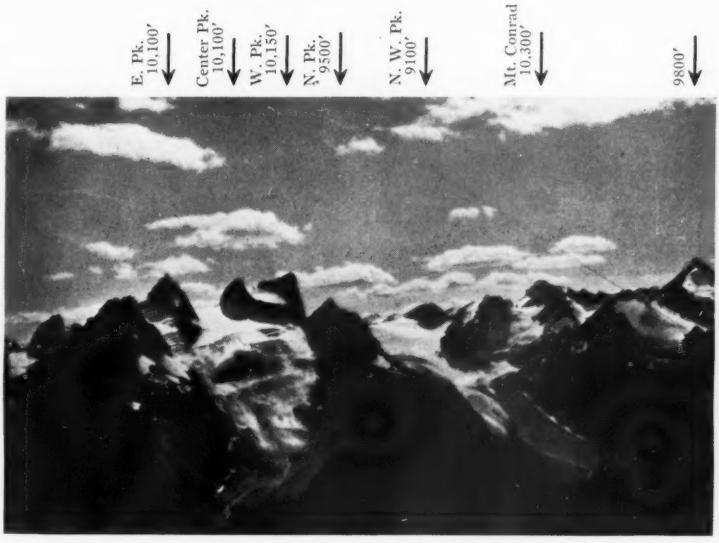
Accordingly, on August 1st, 1939, our expedition started from Spillimacheen, led by Ernest Feuz, Swiss guide, and outfitted by Isidor Kain. We bounced up the rocky road on a truck, to our base camp which was established at the foot of the N. moraine of the Bugaboo Glacier, on the site used by the Hendricks party in 1938. The following two days were spent in setting up a high camp in the last timber beneath Snowpatch Spire. The weather was extremely hot, making backpacking more arduous than usual, and to add to our troubles, the pack-rats and gophers created havoc with our food supplies and personal belongings.

On the afternoon of August 3rd, after carrying up the final load, the first ascent of the E. peak of Eastpost Spire proved a sporting exerciser, occupying three hours from our bivouac—the W. peak having been climbed for the first time by Eaton Cromwell and the writer in 1938. From its summit we obtained a magnificent view of Snowpatch and Howser Spires, and also of the Bobbie Burns Group, the center needlelike peak presenting a particularly inviting appearance. The next day we made the fourth ascent of Bugaboo Spire by the usual and, in fact, only possible route. Rated by the internationally famous guide, Conrad Kain, as his most difficult peak in Canada, we found that it fully lived up to its reputation. Through our fieldglasses we could see that there was little hope of successful attack on either Snowpatch or the S. Tower of Howser, therefore decided to concentrate on the Bobbie Burns peaks which from here looked feasible.

[1] For earlier data on this area of the Purcell Range consult *A. A. J.*, ii, 186, 190; iii, 295; *A. J.*, *46*, 403.



WARREN GLACIER, WITH BUGABOO AND BOBBIE BURNS PEAKS



BOBBIE BURNS GROUP SHOWING N. E. AND N. GLACIERS

Panoramic with view above. Camp was in valley below standing figure and climbs were made by way of the N. Glacier

Photos, G. Engelhard

OUTLIER OF BOBBIE BURNS GROUP ABOVE WARREN GLACIER

CENTER AND EAST PEAKS OF BOBBIE BURNS GROUP FROM WEST PEAK

Photos, G. Engelhard

Photos, G. Engelhard

That evening a light rain fell, but on the following day we set out for the second phase of our objective. Striking the base camp, we moved by packtrain down Bugaboo Valley six miles to Rockypoint. Early the next morning, we were off up Rockypoint Creek, following an old mining trail which evidently had been long in disuse. It wound tortuously through thick alder slides which caught at our packs, and continued through heavy timber in which we occasionally encountered bogs and deadfalls. By noon, however, we had climbed 4000 ft., and had reached the summit of the open alps which divide the watersheds of Bobbie Burns and Bugaboo Creeks. One of the most astounding mountain panoramas which any of us had ever seen met our eyes—the towering granite spires of the Bugaboos and the jagged pinnacled ridges of the virgin peaks to the north, with inviting green meadows spread at their base—seemingly a paradise for campers. From the summit, the ridge descends steeply to the floor of the Warren Valley 3000 ft. below, through a tangled jungle of fallen timber. Although the distance measures only 2.5 miles, it took us 24 hours to negotiate it, as the going was very rough. Great credit is due to Isidor for his ability and persistence in getting the outfit down into such difficult terrain. The deadfall was dense, and fallen logs and small rocky bluffs offered a hazardous footing for the heavily laden horses. They stumbled from weariness, packs slipped and had to be adjusted, and in spots a trail had to be cut through the mass of timber. As a result, we were unable to cover more than half a mile in two hours. When by evening we had reached a little flat in a grove of evergreens by a convenient stream, we decided to call a halt for the night, and give our exhausted animals a much-needed rest. The party started off the next morning, and continued the scramble downward, until at 2 P.M., we finally reached the "inviting green meadows." As an unfortunate blow to our expectations, they proved to be nothing but swamp, extending from the tongue of the Warren Glacier at the head of the valley, for a distance of at least five miles. The only available camping place was a sand and gravel flat bordering a stream flowing out of the N. glacier of the group, infested with bulldog flies and every conceivable variety of insect life. So we swatted flies and ate and drank sand, but at least we had the consolation of knowing that we were the first party ever to inhabit this territory. A record of our sojourn can be found in a

bottle hanging on a tree, but no record could do justice to our language used on the bulldogs.

On August 9th, we left our camp at the mouth of the stream which descends from the large glacier immediately N. of the main Bobbie Burns peaks, and following it closely through bush and alder slides, we made a reconnaissance of the three most prominent peaks of the range. We reached a pass at the head of the glacier from which unfortunately none of these points were attainable. Therefore, we turned our attention to two small peaks, the first *ca.* 9300 ft., in the N. W. angle of the glacier, whose summit we gained *via* the easy rocks of the S. ridge. Descending by the same route, we crossed the glacier in a southerly direction, and climbed up steep ledges to a col in the N. spur of the main group. Here we stopped and put on our sneakers, and proceeded in our attack on the North Peak: a jagged, triangular rock mass, *ca.* 9500 ft., whose S. ridge was followed closely, providing a sporty and varied climb. Two back-stands and a 20-ft. rappel were required in this ascent of 1.5 hours, every moment of which was interesting. The descent was made easily *via* the S. E. face to the col.

Two days later, we retraced our steps to this point, crossing to the N. E. glacier which was ascended for 200 yards. Traversing the bergschrund with some care, we scrambled over dirt and loose rock to the edge of a small hanging glacier, enclosed between the Center and West Peaks. Our original plan had been to make an attempt on the highest or West Peak, *ca.* 10,150 ft., but after gaining the crest of the ridge over a steep ice slope which involved considerable step cutting and interesting work in a bergschrund, we were forced to abandon the idea because of an overhanging gendarme. Therefore, we decided to attack the Center Peak whose appearance had so attracted us from Bugaboo Spire. We changed into sneakers and proceeded up the very steep N. ridge which from below had looked extremely repellent. But to our pleasant surprise, it provided excellent climbing and went very well, so that in an hour we stood on the flat summit rocks and ate our sandwiches in the warm sun. Our descent was over a different route, using a vertical 100-ft. crack in the N. W. face, which led us with two rappels to the ledge where we had left our boots. Although it was now 2 P.M., we decided to make an attempt on the East Peak, and therefore crossed the connecting ridge to the S. glacier. We

circled around Center Peak, thus gaining the foot of the N. ridge of the mountain over scree and ledges on the N. W. face. The arête was followed closely, providing steep climbing on large slabs to a minor summit from which we roped off down a 30-ft. pitch. Two vertical stem chimneys followed, the second requiring a back-stand and bringing us out, at 4 P.M., on the broad tablelike summit so characteristic of this region. Ernest took great care in building a stoneman gigantic enough to be seen from any of the surrounding districts. Then with haste we descended by the same route, reaching camp just as night fell, after a 17-hour day which had added two more first ascents to our list.

August 12th, we rested methodically, but on the 13th we set out again for the West Peak on a route which we had observed from the Center Peak. As on the first day, we followed the N. glacier to its head, whence we descended rapidly S. W. to the foot of the icefall in the S. glacier. Zigzagging upwards through the seracs with much step cutting, we gained the foot of the S. W. ridge in 5.5 hours of continuous going. Once more we changed into sneakers, and followed the crest of the ridge to the summit, across enormous square blocks and knife-edged ridges—easy enough but fun. As the day was magnificently clear and still, we stayed an hour and a half on the broad tablelike summit, admiring the fantastic shapes of the Bugaboos to the S. across the Warren Glacier. The same route was followed on the descent as far as the head of the icefall, where we turned E. and rejoined our route of two days before, on the N. E. and N. glaciers, thus making a complete circuit of the West Peak, and covering a distance of about 15 miles. This was our last climb in the Bobbie Burns, for our time was running short, and we needed the remaining days to do some more work on the trail and get the outfit back to Rockypoint.

We started striking camp on the 15th, and making our preparations for a return to civilization. The packtrain managed the trip up the slope with consummate ease—the slope which had afforded us so much effort and tribulation on the way down—and descended once more to the charming alps, where we spent the night. When we reached Rockypoint the next morning, it was with mingled feelings of satisfaction and regret. Our stay had been eminently successful from all points of view. We had gained our objectives, the most important factor. The climbing at all times was a high order,

which while interesting, never provided us with the grueling moments which we had experienced on Bugaboo Spire. Isidor's cooking had fully met our expectations, and Ernest's leadership was excellent and indefatigable. In addition, we had been unusually fortunate with weather conditions, and had been privileged to view scenery which baffles description. But the experience was over, our introduction to the Bobbie Burns an accomplished fact, and it was with that regret that we mounted our faithful truck, and jounced again down the rocky road to Spillimacheen.

The Murchisons Revisited

GEORGIA ENGELHARD

IN 1938, when Eaton Cromwell, the writer and Edward Feuz made the first ascent of the S. and N. Murchison Towers,[1] we viewed with interest the three other virgin peaks of the district, and decided that at some future date they would make worthwhile climbs. On August 19th, 1939, Ernest Feuz, Francis North and I drove up the Lake Louise-Jasper road as far as Totem Creek at the 40-mile mark. Here we shouldered our packs and proceeded up through the open woods via game trails to our last year's campsite in the last timber at about 6500 ft. The weather was warm and clear, so that sleeping tentless under the stars was a pleasure.

As we had only one day at our disposal, we chose as our objectives the steep and attractive S. E. Tower, *ca.* 10,100 ft., and the little tower on the W. side of the amphitheatre whose northernmost wall is crowned by the majestic S. Tower. The big N. E. Tower[2] lying to the E. of this amphitheatre and forming the E. retaining wall of the Murchison Glacier we decided to leave for another year or another party. Although it is the highest in the group of towers and the approach to it is a long one, it will be a relatively easy climb.

We left camp at 5 A.M. and proceeded by last year's route up the N. bank of Totem Creek, over the cliff-bands bordering the handsome waterfall, past the two turquoise lakes, and in a little over an hour we had reached the boulder-strewn Murchison amphitheatre. The sun was just gilding the sharp summit of the S. E. Tower as we turned up the scree slopes of its S. W. face. We worked rapidly up for about 1000 ft., finally reaching a couloir filled with old snow. Following its southerly edge we clambered up small ledges which provided interesting climbing in places. By 8 o'clock we had gained the base of the N. ridge of our peak. Here we paused to put on the rope and our sneakers and to have a bite of second breakfast, but as a bitter wind was blowing we hastened to get under way.

The climb to the summit was on good solid rock, remarkably so for that region. The ridge was followed throughout, except

[1] *A. A. J.*, iii, 366.

[2] *I.e.*, the S. E. peak (10,659 ft.) of the Murchison massif as indicated on the Banff Park sheet.—*Ed.*

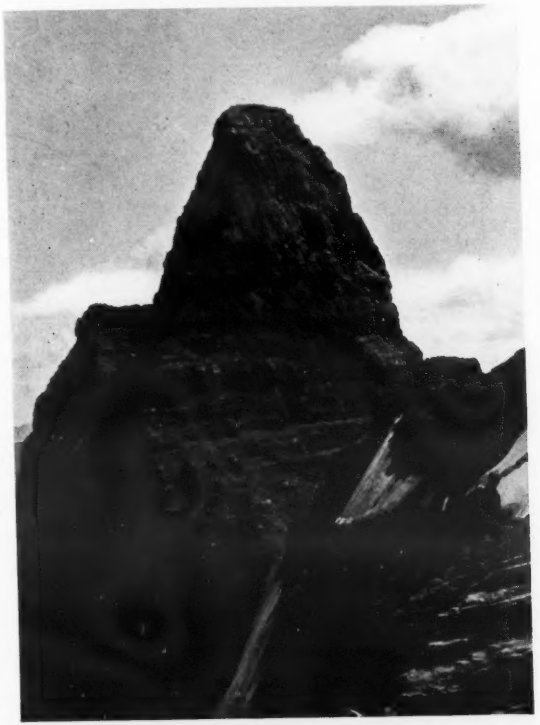
for two traverses on the W. face up almost overhanging 30-ft. pitches. The ridge itself was delightfully exposed, with a great sheer drop to the east onto the Murchison Glacier, but the climbing was never too arduous for pleasure. In 40 minutes we stood on the broad flat summit. Before us lay fine vistas of the Freshfield Group, the Lyells, the peaks of the Clearwater, Bow and Waterfowl Lakes district, while near at hand the S. and N. Murchison Towers with their sheer walls rose impressively above the Murchison Glacier, 3000 ft. below. From here, too, we were able to confirm our opinion that there would be no great difficulty in finding a route up the N. E. Tower.

We built a stoneman and hastened to descend to our boots as it was very cold and suspicious fogs were curling around the neighboring high peaks. We retraced our route of ascent to our breakfast place, using two rope-offs on overhanging pitches, and in half an hour were in our sheltered notch. From here we descended slightly to gain a ridge running to the base of the S. Tower, under which we traversed on broad ledges onto the W. wall of the amphitheatre. By now the wind was blowing so violently that it was difficult to navigate on the broad ridge. By following a goat trail on which we had spied big billy earlier in the day, we reached the eastern base of the little S. W. Tower (*ca.* 9800 ft.) whose summit rose only about 200 ft. above us. Alas, here we were to be foiled, as the rock was very friable, smooth and steep with hardly any holds, while its looseness made the use of pitons undesirable. We searched for an hour without success, but as our time was growing short we decided to give it up. We think that given more time, a route can be forced up this face, which is the only feasible one, as on the other three sides the walls are smooth and holdless; it is in a sense the Snowpatch Spire of that district.

We turned down over easy going on ledges and scree slopes and reached the amphitheatre floor in half an hour, and in an hour more were back in camp, eating a fine meal of steak and tea. We packed up and hastened down to the road, which we reached in an hour.

We can heartily recommend this district, for the bivouac place is a comfortable and sheltered one, the climbs on the S. and N. and S. E. Towers are worth repeating, providing good rock and enjoyable climbing with the possibility of new routes on the first named; while the N. E. and S. W. Towers offer good first ascents.

UNNAMED PEAK (9100 FT.)
N. of Noyes Creek



S. E. MURCHISON TOWER

Photos, G. Engelhard

MT. COND, HIGHEST POINT IN PARK, AND THE KOKANEE GLACIER
S. E. from the summit of the Giant's Kneecap

LOOKING ACROSS KOKANEE LAKE TO KOKANEE PASS
Spokane Mountaineer Base Camp was on wooded point in left middle of picture
Photos, E. L. Dennis

Kokanee Glacier Park

EDWARD L. DENNIS

UNTIL the Spokane Mountaineers of Spokane, Washington, held their 1937 summer outing in Kokanee Glacier Park,[1] about 20 miles N. of Nelson, British Columbia, this interesting region had not been visited in more than a decade by an organized mountaineering party.

During an eight-day outing in August, members of the outing party of twenty-five persons, representing six outdoor clubs, made ascents of twelve of the principal peaks of the area, ranging in elevation from 8300 to 9200 ft. Four of these peaks are unnamed. Although it is certain that at least the higher ones had been climbed before, records of previous ascents were found only on Mt. Cond (9200 ft.), the highest point in Kokanee Park.

Extremely rugged, and revealing much evidence of the presence of tremendous glaciers in bygone ages, the Kokanee region is one of unusual beauty and interest, and offers a real challenge to the mountaineer who seeks new routes to conquer, and rock climbs of first class caliber.

The descriptive prospectus sent to members of the party before the outing said in part: "In an extremely rugged sub-alpine area of 100 square miles this Canadian park contains more than 100 glaciers, twenty of which are of considerable size. Central and most distinctive feature is the Kokanee Glacier, some five square miles of moving ice covering the entire side of a mountain valley along the N. E. side of the Kokanee Range. This ice cap is of immense depth. The park contains 125 alpine lakes and ponds, and fifty-six peaks above 8000 ft. The Kokanee Range runs almost through the center of the park, and, as the park occupies the highest terrain in a large territory, it affords many superb views over adjacent country."

There are two highway approaches to the Kokanee area. One, from the city of Nelson, takes in about 12 miles along the shore of

[1] The mountains of this park belong to the Southern Selkirks, Interior Ranges of B. C. Map reference: Kokanee Glacier Park (1:31, 680), Dept. of Mines, 1925.

Kootenay Lake, then 10 miles directly northward on a steep but reasonably good mountain road to a terminus at the site of the old Molly Gibson mill just inside the park's southern boundary. The other route is W. from the town of Kaslo, well up Kootenay Lake, which borders the entire park on the E., then S. on a water grade to the Joker millsite almost in the center of the park. The latter route is the easier in grade and enables one to ride well into the park, but it offers less attractive camp sites than the southern entrance, and one must climb 1300 ft. out of Joker basin before undertaking the actual ascent of any peak.

Entering via the Molly Gibson millsite, the Spokane party packed in and up 3 miles to a base camp at the southern tip of Kokanee Lake, largest in the park; elevation 6437 ft. Subsequent exploration convinced us that this was the best campsite in the park, and one from which Kokanee Glacier and the higher peaks are readily accessible. It is on a good trail, the only N.-S. trail through the park.

Camp at Kokanee Lake is virtually at timberline, as 7000 ft. is about the upper limit of trees in this area. While the Kokanee region is notoriously stormy, and our mid-August visit coincided with almost the first good weather of the summer, both days and nights were clear, with little wind. Days were warm—but the nights! Bitter cold came down every evening within ten minutes after sunset, and the nights at Kokanee Lake were the coldest ever experienced by the Spokane club on any summer expedition.

Like most mountains, the Kokanee peaks, as a rule, can be climbed by relatively easy routes and most of the climbing done to date has been by such routes. Most of the peaks, however, present one or more faces that will challenge the best of rock climbers, and certain approaches to a few of the higher peaks by way of the glaciers offer objective difficulties in the way of steep ice slopes and large crevasses. Climbing of all degrees of difficulty can be had. New routes remain to be made on virtually every peak. The mountaineering possibilities of the area have scarcely been touched.

The principal glaciers lie on the N. E. slopes of the peaks which nourish them. Several of the larger glaciers are "living" icefields, but most of the park's glaciers are rather small, and are "dead"; that is, the present glacial ice is a remnant of a once large glacier.

No downhill movement occurs, and no new glacier building is taking place.

Just W. of the head of Kokanee Lake is a splendid opportunity to study the rocky bed which had been exposed in comparatively recent times by the melting away of a once-large glacier. Only a small dead glacier now remains, at the upper end of a spectacular slope of deeply scored and polished granite. At one time this glacier was fully a mile long and stretched clear down into Kokanee Pass, just N. of the lake.

Because of past glacial action, virtually all travel above timberline is over and among tremendous granite boulders, which cover the steep hillsides for miles in indescribable confusion. Above these boulder fields, as one approaches the summits, ascent is usually by way of chimneys or steep couloirs. There is considerable danger here from falling or sliding stones. Along the W. side of the great massif which nourishes the Kokanee Glacier, the rock is rotten and loose.

Properly speaking, the central section of the Kokanee Range, containing several of the highest peaks in the park and along the whole length of which lies the Kokanee Glacier, is not a series of separated peaks, but a bulky massif. The named summits rise to points only a few hundred feet above its bulk, and above the upper rim of the icecap.

Our first two excursions from the Kokanee Lake camp to the glacier and these summits took us through Keyhole Pass, a narrow and distinctive notch in the rocky rampart just N. of Esmeralda Peak. From our camp, the route was almost straight uphill, climbing steeply and traveling always over and between and under the previously mentioned gigantic boulders. Scarcely a mile in distance, this climb took more than two hours.

As we neared the notch in the rim, the climbers found themselves in a steep couloir full of loose rock. With a large party (14), it was necessary to keep well closed up and move with caution to avoid dislodging rocks which might strike the rearmost climbers. Once in Keyhole Pass, it was necessary only to surmount a tremendous snowdrift, and before us lay a great expanse of the glacier, and off to the S. E. the summit of Mt. Cond, which we were not able to see from camp.

A short rock climb, offering no difficulties, took us to the summit of Esmeralda (9150 ft.), a feat of utmost simplicity once the arduous ascent to the pass was completed. The W. face of this peak, however, presents a stern challenge to climbers who like their rocks steep and tough. The half mile of glacier between Esmeralda and Cond presented no difficulties, as it is not steep. Crevasses were numerous, but quite narrow. As this sector of the glacier seems to lie in a smooth-bottomed bowl, it is unlikely that dangerous crevasses ever develop.

Mt. Cond (9200 ft.) shares with Kane Peak in the Sawtooth ridge the distinction of being the park's highest point. From the glacier we approached along the crest of a huge snowdrift, and found the short rock scramble to the top very easy. This was on the peak's N. side.

In a cairn were a few poorly preserved records of previous climbs, in a tin cup. Most of them dated back twelve or fifteen years to the days when the Kokanee Mountaineering Club of Nelson was active in the region, and had its headquarters at the Slocan Chief mine cabin below the N. W. tongue of Kokanee Glacier. The Spokane party built the cairn higher and placed the old records, with a record of our climb, in one of the club's official register boxes, which was duly installed with fitting ceremony. It is, to date, the only club register our club has placed in Canada.

Again we crossed the glacier, more than a mile this time, with no difficulties although one steep slope was traversed. Here we reached our most interesting climb of the day, the Giants Kneecap (9134 ft.). Entirely surrounded by the glacier, this summit is a fairly small pyramid of granite, thrusting some 400 ft. above the ice to a sharp point. After some reconnaissance, we tackled its western face, which proved to be an easy climb on a series of ledges, of sound rock and ample width for any but the most timid. Near the top a small overhang offers some slight difficulty. On any other side, this rock upthrust offers a climb of considerable difficulty.

Still gaining altitude, we continued from the Kneecap almost due W. toward the upper rim of the glacier. Here on the rocky wall which edges the ice, a small point, easily climbed, rises to an elevation of 9128 ft., and while unnamed, may fairly be counted as a summit. From this point we returned to Keyhole Pass, went

down the couloir with great caution, and thence over the boulders to camp. As an indication of the conditions encountered, our day's jaunt had covered about 6 miles, including 2 over the boulder fields and nearly 3 on the glacier. We had visited four summits, and taken time out for three lunches and considerable picture taking. Elapsed time away from camp was 11 hours.

Our most arduous and most interesting trip was to Haystack and Kokanee Peaks near the end of our stay. A near accident and a return to camp hours after dark by half of the party were included in the day's events. Out of camp at the lake, our route was S. E. around the point of the sharp ridge running down from Esmeralda, then diagonally uphill over the inevitable boulder fields toward the saddle between the two peaks above named, which is some 800 ft. lower than the summits. Through the saddle we could see the sun glistening on Haystack Glacier.

Before reaching the saddle, and swayed against his own judgment by opinions of his party, the leader turned directly uphill toward a notch in the rim just below the summit of Kokanee Peak. The climbers soon found themselves in a narrow, deep couloir, with a great amount of loose rock underfoot. The going became extremely steep, necessitating much care to prevent rolling rocks. On cliffs at either side were balanced great blocks of loose granite. So intangible did their perch seem that the climbers were almost afraid to shout, lest it bring down one of the balanced giants.

Haystack Peak (9038 ft.), taking its name from the abrupt rock hump on its summit, offered us a fairly steep glacier with several large crevasses, and a short rock climb of moderate difficulty to the highest point. We came up the glacier on the N. E. slope, and up a chimney in the N. face of the rock, swinging around to the W. side of the hump for the final climb over a series of ledges. From the top we could see the city of Nelson, much of Kootenay Lake, and Mt. Assiniboine.

Glissading down to the saddle, we divided forces, half of the party electing to return to camp, the others going on to Kokanee Peak, the only one in the group around camp as yet unclimbed by our party. The ascent to the 9000-ft. summit, approaching the final climb from the E. was scarcely more than an uphill hike from the saddle, with a little steep glacier work just below the final rock pitch. It was in the descent that the party got into trouble.

As a return via the saddle to the S. was a roundabout route, the party of five elected to go straight down the W. face of Kokanee Peak on the rock. They dropped several hundred feet in altitude with no difficulty, working on broad ledges. Then all avenues of descent ran into a sheer cliff, below which it was impossible to judge the feasibility of the route. Due to unsoundness of the rock, the leader refused, wisely, to consider roping down the sheer bit. The party climbed clear back to the summit and turned N. along the rim of the glacier.

Two attempts were made to come down into the Kokanee Lake valley through notches in the rim similar to Keyhole pass. Both failed, because the descents were beyond the ability of even this well-schooled party. Finally it was decided to cross the glacier, going around Mt. Cond to the E. and thence across familiar ice to Keyhole Pass and down to camp.

Just S. of Mt. Cond this attempt was blocked by a maze of huge crevasses. After crossing and recrossing several dangerous spots, this route was judged impossible if safety was to be regarded. The weary quintet now had to go clear back to the saddle between Kokanee and Haystack, which they had previously scorned in search for a shorter route. Part of the arduous descent over the boulder field, and all of the floundering return through the thick brush of lower levels, were made in the dark. Cold, weary and hungry, the ambitious five reached camp at 10 P.M., after 16 hours of absence, greatly relieving the worries of those who had returned earlier from Haystack Peak, and who were beginning to envision their comrades in dire dangers on the glacier.

Other climbs by the Spokane party included the Battleship (8500 ft.), a sharp summit sticking above the ice at the northern end of Kokanee Glacier; and—W. and S. W. of Kokanee Lake—Outlook Peak (8500 ft.), Sunset Peak (8535 ft.), and three unnamed peaks (8500, 8400 and 8400 ft.). These climbs were full of interest, affording some fine views of Glory basin and more distant country. The actual climbs were only moderately strenuous, and the only objective difficulties were short pitches of rock work near the summits.

One climbing party found some rather strenuous rock climbing by going N. through Kokanee Pass, then turning E. and climbing right up the side of the valley to the rim above Kokanee Glacier.

Some difficult chimneys were found in the upper stretches, nothing, however, that an average rock climber could not negotiate.

Aside from rugged scenery and varied climbing possibilities, the Kokanee area has much to offer the outdoor lover. The numerous lakes and streams are gems of alpine beauty. Small game is abundant and remarkably tame. That amusing and friendly little inhabitant of the high rock slides, the cony, rock rabbit or pika, was present in thousands wherever we went, and his shrill call of "yeep, yeep," could be heard day and night. Marmots were also plentiful and a few mountain beaver were seen. Numerous large and beautifully colored squirrels shared our campsite, and within four days were eating out of our hands. Ptarmigan were encountered on nearly every excursion, and one old hen calmly settled down right in the midst of our base camp.

Bear, both brown and grizzly, and deer are reported plentiful in the area, but our activities, being all at 6500 ft. and above, were too high for their summer range in this vicinity, and none were seen. Tracks of woodland caribou were seen on a snowfield, but we never glimpsed the animals. Although our visit was too late in the season for the best mass displays of mountain flowers, botanists in the party identified 120 species of flowering plants above the 6000-ft. elevation, and about thirty varieties of birds.

In conclusion a few words about the personnel of our party may be of interest. The party as a whole owed a great debt of gratitude to H. M. Whimster of Nelson, a member of the Alpine Club of Canada for more than 25 years. "Brownie" as he was nicknamed before the outing ended, did a great deal of work on the Canadian end of the job of getting advance data on the area and in lining up supplies. Without his efforts, we should have been unable to obtain adequate pack-horse service to take our outfit from the end of road to the base campsite.

Not only did Mr. Whimster help personally with the packing, but he led the first excursion to the Kokanee Glacier, being the only member of the party familiar with the terrain. On the day we broke camp, all members of the outing stopped at his home on Kootenay Lake for a swim and for what was certainly the most wonderful luncheon ever enjoyed by any bunch of crag-rats returning out of the high country to civilization.

Joining our group of relatively inexperienced Spokane climbers were John and Aletta Lehmann of the Everett branch, Mountaineers, Inc. (Seattle); keen appetites were well cared for by Mr. and Mrs. Ross H. Palmer of the Spokane Club, who have handled the commissary on every summer outing held by the group; while the writer of this article was general chairman of the outing.

Besides the host club in Spokane, and those represented by the Whimsters and Lehmanns, the party included members of the Klahhane Club, Port Angeles, Wash.; Trails Club of Portland, Ore.; and the Selkirk Ski Club of Spokane.

A final word must be said in tribute to Canadian hospitality, which is certainly tops among the much-vaunted far western brands, and to the assistance given by the Nelson Board of Trade. This body gave the Spokane group much help in planning details of the outing and in avoiding any delays incident to two crossings of a foreign border by our sizable party and considerable equipment. Kokanee Park is one of two localities where our club has held summer outings that we are all agreed we want to visit again.

Alps Across the Footlights

J. Monroe Thorington

"AY, now I am in Arden," complains *Touchstone,* "the more fool I; when I was at home I was in a better place; but travellers must be content." One recalls that mountaineers on occasion have paraphrased and embellished this speech—frequently in forced bivouacs above the snowline. However, life is not made up solely of action, and it is sometimes pleasant merely to sit and dream, knowing that "All the world's a stage."

Several years ago we had occasion to examine a collection of more than 3000 playbills, representative of some seventeen London and provincial theatres during the period 1777-1837. It occurred to us, while writing *Mont Blanc Sideshow*—a biography of Albert Smith—to look at these with an Alpine eye, to see whether mountains had made any impression on stage production.

Saussure, the Geneva natural scientist, anticipating Byron's *Manfred,* suggests in his *Voyages* (§ 735) that dramatists who have exhausted the incidents of pastoral life should place their settings in the Alps, and even sketches a plot. A crystal-hunter, loving a maiden and being loved in return, but unable to marry because of poverty, risks his life to gain a mass of crystal in a dangerous situation. His sweetheart, fearing for his safety, goes in search of him. Saussure adds, "The depiction of such unusual events would enrich theatrical production in an absolutely new manner."

For a long time this suggestion fell on deaf ears; playwrights of his day were students of the classics, and geography and travel had no interest for them until travellers returning from the Grand Tour forced the marvels of the Simplon and the St. Gotthard upon their bewildered attention. Would the new note *take?*

The first account in English of the Paccard-Balmat ascent of Mont Blanc (a translation of Bourrit's pamphlet) appeared in the *Scots Magazine* for November, 1786, while the story of Saussure's success was published in the *Gentleman's Magazine* for October of the following year. Yet one looks in vain for any echo of these happenings in the British playbills of the closing years of that century. Continuing, however, one comes upon items with Alpine

title justifying the purpose of the search, and we have sought additional information wherever Alps are mentioned as being represented in the scenery.

It is all gone now, like a procession of men with music disappearing up a lane, leaving a faint noise for memory. The things of the stage are ephemeral, and the elusive spirit of lost laughter slips away. But once, in the recollection of the wonders of Chamonix and Grindelwald, artificial Alps arose in London to gleam for a night and vanish. The curtain rises.

On the night of April 12th, 1796, wearing your best flowered satin waistcoat, you called a cab and escorted a delicately eager young lady (who had heard of that personable young Englishman, Mr. Greville, dashing across the St. Gotthard in his demountable chaise) to the Theatre Royal, Covent Garden, there to witness a comic opera in three acts called TRAVELLERS IN SWITZERLAND. The bill states, "first time these two years," the part of *Dalton* being taken by Mr. Incledon, who taught music to Edmund Kean, and for whose benefit the performance was given. Appropriately, *Miss Somerville* was enacted by the well-known vocalist, Mrs. Mountain, and the whole concluded with a dance called the Savoyard.

You were young then, but did not in all likelihood become too sedate to enjoy THE MOUNTAIN ROBBER; OR, THE TERRIFIC HORN, as presented at Drury Lane in June, 1806, or THE MOUNTAIN BELLS, a musical sketch at the Richmond Hippodrome, October 19th, 1808. An operatic romance in three acts, THE DEVILS BRIDGE, with music by C. E. Horn and John Braham, would have drawn you to the Lyceum, May 6th, 1812, if only to see *Count Belino* enacted by Mr. Braham (of superb voice) and *Lauretta* by Fanny Kelly, to whom Charles Lamb proposed in 1819 when she was twenty-nine. Other performances of this operetta were given at the Theatre Royal, Drury Lane, February 20th, 1813, and English Opera House, September 2nd, 1823.

At Drury Lane, April 4th, 1815, as well as at Covent Garden, May 29th, 1817, the adventures of Don Quixote were gaily offered in THE MOUNTAINEERS But there must have been earlier performances, for the D. N. B. states: June 9th, 1806, "Edmund Kean made his first appearance at the Haymarket, playing *Gamlin* in the 'Mountaineers.'"

THE MOUNTAIN CHIEF was a romantic drama with music by Lanza, given at Drury Lane, April 4th, 1818. Less successful was the performance of SWITZERLAND, opening there on February 15th, 1819, the D. N. B. remarking: "Miss Porter's 'Switzerland,' in which Kean played *Eugene,* was only acted once, and Kean was charged with want of loyalty and gallantry in playing the hero in perfunctory style." More diverting was the pantomime ballet, THE SWISS VILLAGERS, also at Drury Lane, February 3rd, 1823.

"By particular Desire of Several Ladies," so reads the bill, a farce THE HUNTER OF THE ALPS was offered at the Theatre, Wantage, on January 17th, 1823, enacted between the play of *The Castle Spectre* and an afterpiece, *Harlequin's Gambols.* Because of the freezing weather the management was careful to announce "Good Fires Kept."

WILHELM TELL, Schiller's last completed drama, had made a deep impression when first performed at Weimar, March 17th, 1804, and is the more remarkable in that the author never saw the scene of his play, obtaining the local information from his wife, from Goethe, and from the writings of Scheuchzer and others. Yet one would imagine that he had spent the greater part of his life in contact with the simple herdsmen of Uri and Schwytz. Although less concerned with the fate of his hero than with a people's efforts to shake off tyranny, Schiller yet contrives in the scene of the shooting of the apple to depict his characters with bold relief in a situation of superb and timeless grandeur.

Tell: Ich soll
Mit meiner Armbrust auf das liebe Haupt
Des eignen Kindes zielen?—eher sterb' ich!

[What, I! Level my crossbow at the darling head of mine own child? No—rather let me die!]

Even now, at the close of a performance at Altdorf, one leaves the theatre with no feeling of coming from a world of imagination into one of reality.

A presentation, said to be the first in America, was given by German and Austrian refugee actors at Hollywood, May 25th, 1939. The interesting scenery of Acts I and II, designed by G. Vagnetti for the Florence May Festival, is reproduced in *Illustrated London News,* June 3rd, 1939.

That the Grand Tour frequently included a visit to the Lake of Lucerne, doubtless accounted for the flurry of anticipation attending the announcement displayed at the New Theatre Royal, Drury Lane, May 11th, 1825, to the effect that "His Majesty's Servants will perform (for the First Time) a New Historical Play." This was WILLIAM TELL by Sheridan Knowles, interspersed with music by Henry Rowley Bishop—knighted in 1842, the first musician to receive that honor. The part of *William Tell* was taken by William Charles Macready, in this as well as the performance at the same theatre, February 25th, 1828. In the course of the play the following new scenery was used: The Castle and Town of Altorf. The pass of Grütli. William Tell's Cottage on the Mountain. Mountain Torrent. The Entrance to Gessler's Castle. The Market-Place of Altorf. Environs of Altorf. Vicinity of Gessler's Castle. The Fortifications from the Land side. Some of these scenes were designed by William Clarkson Stanfield, the most distinguished scenic artist of the nineteenth century, and were the most elaborate Alpine views that had yet been exhibited on the stage.

It was more than outdone, however, when Rossini's historical opera, GUILLAUME TELL, first produced in Paris on August 3rd, 1829, was offered in London. Originally in five acts, it was condensed to three, and given in English at Drury Lane, May 1st, 1830, under the title of HOFER; THE TELL OF TYROL, the events of the Napoleonic wars being more in the public mind at the time than the original legend. Arranged and adapted for the English stage by H. R. Bishop, the part of *Andreas Hofer* was taken by Mr. Phillips, while *Josephine Negretti* was enacted by Mme Vestris, granddaughter of the engraver, Bartolozzi.

The realistic Alpine scenery, again designed by Stanfield, was as follows: 1. Village in the Pusterthal, with the glacier called the Grauewand Ferner in the distance. 2. Forest. 3. Ravine (sunset). 4. Interior of Tyrolean tavern amongst the mountains. 5. The glaciers by moonlight, with the rising of the Tyrol. 6. Pass of Lueg from the rocks above the River Sill, with the Tyrolean ambush. 7. An apartment in the Castle of Innspruck. 8. Marketplace of Innspruck in fair time, with the building called the Golden House.

Theatre Royal, Drury Lane.

This Evening, TUESDAY, May 4, 1830.

His Majesty's Servants will act a New GRAND HISTORICAL OPERA, called

HOFER,

THE

Tell of the Tyrol.

The MUSIC entirely from the celebrated Opera, GUILLAUME TELL, composed by

Rossini;

Arranged and adapted for the English Stage by

Mr. H. R. Bishop.

The regular CHORUS, with numerous Additions, under the Direction of Mr. J. T. HARRIS.

The SCENERY entirely New, by Messrs. *MARINARI, ANDREWS, ADAMS,* and

Stanfield.

The MACHINERY, by Mr. NALL.—The PROPERTIES by Mr. BLANIRE.—The DRESSES, by Mr. PALMER, and the Misses SMITH

The DANCES, composed by

Mrs. W. Barrymore.

Bavarians.

The Commandant of Innspruck, Mr. THOMPSON, Colonel Donner, Mr. BLAND,
Herr Stetten, *(Circle Captain of the District)* Mr. WEBSTER,
Batz, Mr. SALTER, Officers, Messrs. HOWELL, FENTON, WIELAND, CHIKINI.
Bavarian and Austrian Officers and Soldiers.

Tyrolese.

Andreas Hofer, ... Mr. H. PHILLIPS,
(His second Appearance at this Theatre)
Father Joachim Haspinger, *(a Capuchin)* Mr. BEDFORD,
Gottlieb, *(a Substantial Farmer in the Pusterthal)* Mr. YARNOLD,
Walther, *(a Young Peasant of the Lower Innthal)* Mr. SINCLAIR,
Hans. Mr. BARNES, Stephen, Mr. TAYLEURE,
Karl, *(Gottlieb's Son,)* Miss CHIKINI,
Bertha, ... *(Gottlieb's Daughter)* .. .... Miss STEPHENS,
Josephine Negretti, ... *(her Cousin, a native of Belluno)* .... Madame VESTRIS,
Margaretta, *(Kellarin of a Tavern)* Mrs. NEWCOMBE,
Therese, } *Peasants* { Mrs. BEDFORD,
Maria, } { Miss FAUCIT,
Principal Dancers, with a numerously extended Corps de Ballet :—
Miss ANGELICA,
Miss RYAL, and Miss MACDONALD,
Misses BALLIN, LIDIA, M'HENRY, LANE, VALLANCEY, GRAU, WEBSTER, WILLMOTT, CLAIRE,
Messrs. Holland, Wentworth, George, Henderson, Dubinzon, Saunders, &c. &c.
Mountaineers and Valesmen, Inhabitants of Innspruck, Female Peasants of the various Valleys of the Tyrol, &c.
Austrian Officers, Troops &c.

SCENERY.

1. ....**Village in the Pusterthal, with the Glaciers called the GRAUEWAND FERNER** in the Distance. .... *Stanfield*
2. .. .. ***FOREST.*** .. *Adams & Andrews*
3. .. .. **RAVINE. (Sunset.)** .. *Andrews*
4. ..**Interior of Tyrolean Tavern amongst the Mountains.** .. *Andrews*
5. .... .. **THE GLACIERS, (by Moonlight)** *Stanfield*

WITH THE RISING OF THE TYROL.

6. .... **PASS OF LUEG,**
From the Rocks above the River Sill, with TYROLEAN AMBUSH. - - *Stanfield*
7. .... **An Apartment in the Castle of Innspruck.** .. *Marinari*
8. .... **Market-Place of Innspruck, in Fair Time,**
With the Building called the Golden House. .. *Stanfield*

After which will be produced, a new Farce, in Two Acts, to be called,

A JOKE's A JOKE;

Or, Too Much for Friendship.

Alderman Gogus, Mr. W. BENNETT, Jack Wildman, Mr. JONES, Tom Mango, Mr. HARLEY,
Barney, Mr. HUGHES, Night'rade (*a Watchman*) Mr. SALTER, Batts, Mr. YARNOLD,
Bill, Mr. WEBSTER, Traveller, Mr. WEEKES, Watchman, Mr. FENTON.
Mrs. Mango, Mrs. GLOVER,
Louisa, Miss FAUCIT, Fanny, Mrs. WEBSTER.

☞ *In order to produce the necessary effects of Light and Shade the Chandeliers round the Front of the Boxes will not be used on the Evenings of the Performance of* '**MANFRED.**'

Theatre Royal, Covent Garden.

This Evening, THURSDAY, October 30th, 1834,

Will be performed, (**Second Time**) the Grand Dramatic Poem of

MANFRED!

Written by the Right Honorable Lord BYRON.

With NEW MUSIC, EXTENSIVE SCENERY, MACHINERY, DRESSES, and DECORATIONS.

The MUSIC Composed expressly by Mr. H. R. BISHOP, who will preside in the Orchestra
The BAND on a most extensive Scale, will be Led by Mr. T. COOKE.

The Scenery by Mr. GRIEVE, Mr. T. GRIEVE, Mr. W. GRIEVE and Assistants.
The Transformations and Properties by Mr. W. BRADWELL.

The MACHINERY by Mr. H. MORAN, and Assistants. The DRESSES by Mr. HEAD, Mrs. COOMBS, and the Assistants of both Theatres

The Drama produced under the Superintendance of Mr. FARLEY.

☞ *In order to give every possible effect to the extensive Scenery, it has been found necessary to lay down A NEW STAGE.*

Count Manfred, ... Mr. DENVIL.
(His Second Appearance at this Theatre)

Chamois Hunter, Mr. COOPER, Abbot of St. Maurice, Mr. WARDE,

Manuel, Herman, } *Dependants of Count Manfred* } Mr. YOUNGE, Mr. KING,

Arimanes, ... *(the Principle of Evil)* .... Mr. HOWELL.

Spirits and Destinies tributary to his will:—

Vesper, *(Spirit of the Air)* Miss POOLE,

Orus, ... *(Spirit of the Mountains)* .... Mr. W. H. PAYNE,

Thamnus, *(Spirit of the Waters)* Miss KENNETH,

Ruslan, *(Spirit of the Storm)* Mr. F. COOKE,

Nox, ... *(Spirit of the Shadow of Night)* .... Mr. DURUSET,

Omorades *(Spirit of the Elements)* Mr. G. BENNETT,

Astaroth, *(Spirit of the Earth)* Mr. F. SUTTON,

Nemesis .... *(Goddess of Vengeance)* .... Miss TAYLOR,

Clotho, Lachesis, Atropos, } *The Three Destinies* } Miss LEE, Miss MURRAY, Mrs. CHESTER.

The Phantom of Astarte, ... Miss CLIFTON,

The Witch of the Alps, Miss E. TREE,

Other Witches and Spirits:

Messrs. Chubelet, Seguin, Templeton, Bedford, Henry, Easton, Mears, Yarnold, Allcroft, Birt, Chant, Galli, Healy, T. Jones, S. Jones, Miller, G. Smith, T. Smith, S. Tett, C. Tett, Tolkien, White.

Mesdames Shirreff, Betts, H. Gawse, Fitzwilliam, Crouch, Chester, Newcombe, Somerville, Allcroft, Boden, R. Boden, Connelly, Dalton, East, Goodson, Goodwin, Mapleson, Neville, Nursey, Perry, Baltis, Bosoke, S. Bennett, Davis, Fairbrother, F. Foster, Hall, Hill, Hudson, Hunt, Jeans, Jones, Lydia, Marchant, Marsano, Payne, Ryals, F. Sutton, Valancy, Vials, &c., &c.

Good Spirits, Mesds. Barker, Wells, Thomas, Evelina, Sanders, Smith, Allford, Green, Woldeck, Roy, &c.

Evil Spirits, Messrs. Banks, Trueman, Phillips, Adams, Norton, Hillyard, Thomson, Parsons, Honor,

The following is the Order of the Scenery, &c. &c.

ACT I.

A HALL in the CASTLE OF MANFRED,

With the Apparition of the Spirits of the Elements!

A WILD ROCKY PASS!

Wherein is introduced

The Incantation of the Witches,

THE JUNGFRAU MOUNTAIN

ROMANTIC SCENE AMONG THE GLACIERS!

CONTINUATION OF THE SCENERY AND INCIDENTS

In which the Witches Bag

The MALEDICTION

A CATARACT in a

LOWER VALLEY OF THE ALPS!

With the Appearance of

The Witch of the Alps, beneath its Sunbow!

AND THE

Carnival of the Witches.

ACT II.

TERRACE OF COUNT MANFRED'S CASTLE.

HALL OF ARIMANES: or

ABODE of the EVIL PRINCIPLE

Wherein is introduced

THE HYMN OF THE SPIRITS!

THE INVOCATION!

And the Nocturnal Revel of the Destinies.

A CHAMBER in the CASTLE OF MANFRED!

With the Embodying of the Spirit of Earth.

THE GLACIERS OF THE UPPER ALPS!

PARTLY

Borne down by a violent THUNDER STORM,

And exhibiting in their Ruins, the Existence of

Crime & Punishment, with the Moral of the Drama

Books of the Programme, Scene, and Characters are Published, and may be had in the Theatre, Price Ten Pence.

After which the very popular Farce of

MY NEIGHBOUR'S WIFE!

Mr. Somerton, Mr. COOPER, Mr. Brown, Mr. MEADOWS, Mr. Smith, Mr. BARTLEY,
Mrs. Somerton, Miss TAYLOR, Mrs. Brown, Miss KENNETH, Mrs. Smith, Miss MURRAY.

To conclude with (**10th Time**) a Petite Comedy, in Two Acts, entitled

THE REGENT!

Philip, *(Duke of Orleans, Regent of France)* Mr. VINING,
The Abbe Dubois, *(his Minister)* Mr. BARTLEY,
Porto Carrero, ... *(Secretary to the Spanish Embassador)* .... Mr. BAKER,
Captain D'Aubigny, Mr. BRINDAL,
Vendier, *(Page to the Regent)* Mr. MEARS, Man, Mr. EATON,
The Duchess du Maine, Mrs. NEWCOMBE, Rose, Mrs. H. CRAMER,
Justine, Mrs. HUMBY, Lisette, Miss LEE, Manton, Miss MURRAY,
Julie, Mrs. CHESTER, Fanchon, Miss SOMERVILLE.

LORD BYRON'S GRAND DRAMA OF

MANFRED!

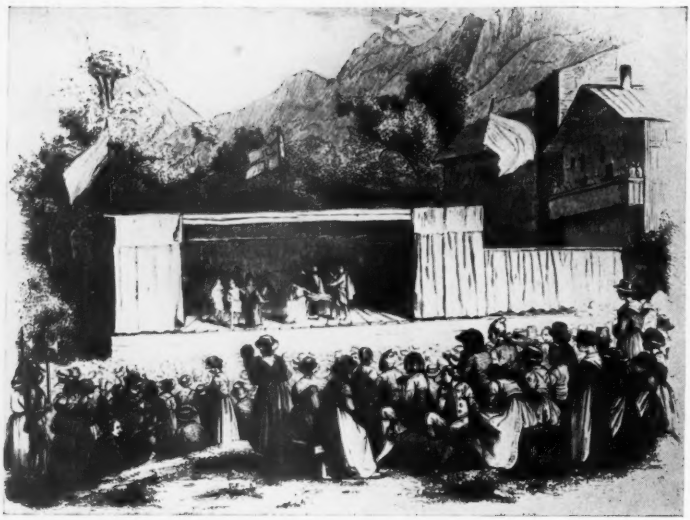
having been received with the enthusiasm due to its immortal Author, and announced for Repetition, with the full sanction of the Public, it will be performed

Every Evening until further notice.

Count Manfred, Mr. DENVIL.

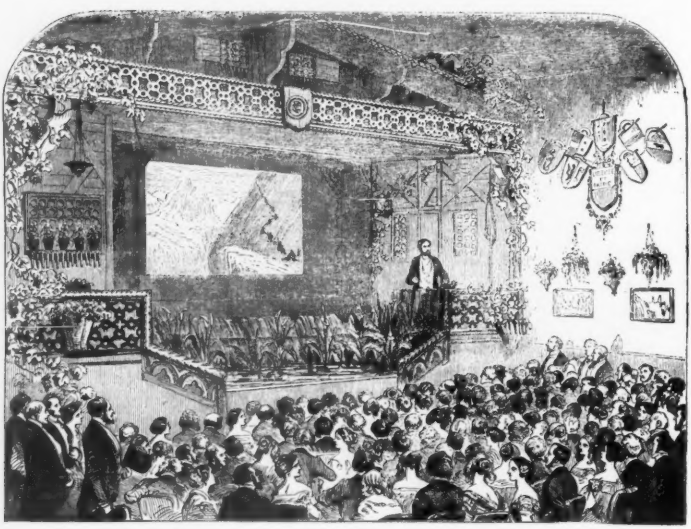
☞ **In consequence of the unprecedented Expence attendant upon the production of 'MANFRED,' the Free List (except the Press) will be totally suspended.**

Turner Lee of Regent. No Money returned [illegible] Doors Open [illegible]



PEASANT THEATRE AT STALDEN, 1842

Nouveaux Voyages en Zigzag



ALBERT SMITH'S MONT BLANC ENTERTAINMENT AT EGYPTIAN HALL IN 1852

Illustrated London News

A presentation with Swiss setting was given in Italian at Her Majesty's Theatre in 1839. The time is the thirteenth century; the place, Switzerland. Acts I and II are laid on Lake Lucerne; Act III in the marketplace of Altdorf on the hundredth anniversary of Austrian rule in Switzerland. In Act III the shooting of the apple is introduced. While the opera is now seldom given, the overture has attained world-wide fame, its motifs representing a calm followed by storm, this in turn by a *Ranz des Vaches*. The final section, with trumpet call, is supposed to suggest the call to arms and the uprising of the Swiss against the Austrians.

Among the lighter productions at Drury Lane were THE SWISS COTTAGE; OR, WHY DON'T SHE MARRY, January 15th, 1833, by Thomas Haynes Bayly, and THE TYROLESE PEASANT, a domestic drama in two acts, on May 8th of the same year. THE MOUNTAIN SYLPH, presented at the Lyceum, August 25th, 1834, as well as at Drury Lane, January 28th, 1837, and February 17th, 1840, is considered to be the first modern English opera. It was in two acts, written by Thackwray and composed by John Barnett, and the song, "Farewell to the Mountains," sung by Mr. Phillips, is said to have produced an effect of extraordinary beauty.

All of this was eclipsed by the performance of MANFRED, Lord Byron's dramatic poem, given at the Theatre Royal, Covent Garden, October 30th, 1834 (then for the second time). The excitement was intense. "In order to produce the effects of Light and Shade the Chandeliers round the Front of the Boxes" were not used, and to give every possible effect to the extensive scenery it was found desirable to lay down a new stage. The music was composed expressly by H. R. Bishop, who presided in the orchestra, while the band (on a most extensive scale) was led by Mr. T. Cooke.

Count Manfred was enacted by Mr. Denvil; Mr. Cooper was the *Chamois Hunter,* and Miss Ellen Tree the *Witch of the Alps*. The Free List (except the Press) was totally suspended; no money refunded; *Vivant Rex et Regina!*

The following was the order of the scenery: "A Hall in the Castle of Manfred, with the Apparition of the Spirits of the Elements! A Wild Rocky Pass! Wherein is introduced the Incantation of the Witches. The *Jungfrau Mountain* Romantic Setting among the Glaciers! in which the Witches sing the Malediction.

A Cataract in a Lower Valley of the Alps! with the appearance of the Witch of the Alps, beneath its Sunbow!"

"The Glacier's cold and restless mass
Moves onward day by day;
But I am he who bids it pass,
Or with its ice delay.
I am the spirit of the place,
Could make the mountain bow
And quiver to his cavern'd base—
And what with me wouldst *Thou?*"

Act II included the "Nocturnal Revel of the Destinies. A Chamber in the Castle of Manfred! with the embodying of the Spirit of Earth. *The Glaciers of the Upper Alps!* partly borne down by a violent Thunder Storm, and exhibiting in their Ruins the Evidences of Crime and Punishment, with the Moral of the Drama."

This was the first time that the Jungfrau was shown on a large scale in stage scenery, and aroused much favorable comment among those who had visited Wengern Alp in preceding summers.

THE ALPINE HOLD, at the Victoria, June 3rd, 1839, was a play by J. T. Haines; while the four-act melodrama entitled MT. ST. BERNARD; OR, THE GOLDSMITH OF GRENOBLE, at the Adelphi, October, 1839, enlivened by the American comedians, Hackett and Rice, claimed to be "full of murderous excitement, set off with good scenery."

A link with our own time, for it is still given today, is LINDA DI CHAMOUNI, at Her Majesty's Theatre, March 25th, 1843. Donizetti's opera, first produced in Vienna in 1842, was also performed at Drury Lane, January 12th, 1848. Time, 1760—Louis XV; place, Chamonix and Paris. Three acts: I, Departure; II, Paris; III, Return. Acts I and III are laid in the village of Chamonix, and *Linda's* famous soprano aria, "O Luce di quest' anima," is sung in the first act, the part being taken in the first American performance by Patti.

The original London performance is described as "One of those simple and pathetic tales of domestic interest, which, though it may slide easily into maudlin by spoken dialogue, is the very thing for music . . . it includes a Swiss maiden (Persiani), honourably beloved by a young nobleman in disguise (Mario), and persecuted by a licentious suitor (F. Lablache), her faithful friend and play-

mate, a boy (Brambilla), who unconsciously interposes for good in every crisis of her fate, her venerable father (Fornasori), and the upright and plain-dealing magistrate of the village (Luigi Lablache, Franco-American singer who taught Queen Victoria) . . . the getting up of the opera, too, is almost unprecedently complete for London: the departure of the mountaineers for Paris, which closes the first act, being a picture as simply affecting from its truth, as any we recollect."

The American première took place in Palmo's Opera House, New York, in 1847, and it was also given at the Academy of Music, during the mid-eighties. Patti took the part of *Linda* in the New York performance at the Metropolitan on April 23rd, 1890. The Chicago Opera Company, with Galli-Curci in the title part, gave the first New York performance of the opera since Patti's day at the Lexington Theatre, February 4th, 1919. In the Metropolitan revival, March 1st, 1934, the lead was taken by Lily Pons; Mmes Swarthout and Vettori and Messrs. Crooks, de Luca, Pinza, Bada and Malatesta in the cast; Serafin conducting.

The story is that of the French drama, LA GRÂCE DE DIEU, the title having topical significance at the time. In Paris when the question was asked, "Qu'est-ce que la Savoie" the reply was: "C'est la grâce de Dieu!" The fitness of uniting Savoy with France had been remarked upon for two centuries, and became a reality in 1860.

Albert Smith adapted and translated the French version as THE PEARL OF CHAMOUNI about 1844, the exact date and the minor London theatre being unrecorded in his *Story of Mont Blanc,* where he writes that "The valley and village of Chamouni, as seen from the Col de Balme pass, with Mont Blanc in the distance," formed an outstanding scene made as true to life as possible. *Linda* was the name of the St. Bernard presented by Smith to Charles Dickens. Sir Henry Dickens, his last surviving child, wrote in 1932 that when very young he had played with the dog.

In a book, *Mont Blanc Sideshow,* the present writer has traced the development of Albert Smith's one-man show, which ran at Egyptian Hall, Piccadilly, during the years 1851-60. It had its origin in the original paintings by Smith himself, with which he and his brother, Arthur, following a summer tour, enlightened

Surrey villages during 1838-40, Mont Blanc being the theme, based largely on Auldjo's account.

For the new performance, following Smith's own ascent in 1851, he employed William Beverley, the scenic artist, to paint the views. The late Douglas Freshfield attended at the age of nine. Its success was unprecedented, and had Albert Smith not died at an early age, would, in Edward Whymper's opinion, be running yet. "Those last luxurious days when St. Bernard dogs lay in front of the stalls, and on closing nights of each season beautiful bouquets were presented to the ladies by the entertainer." That 2000 performances (the record of the century) were given before his voyage to China is proof of Smith's exceptional magnetism.

Planché's review, ASCENT OF MT. PARNASSUS, bringing first-night crowds to the Haymarket on March 28th, 1853, included a parody scene of the Mont Blanc entertainment just described. Albert Smith himself, one evening, took the part of the *Spirit of Mont Blanc,* much to the mystification of Mr. Buckstone, who had been kept in ignorance of the substitution.

The stage directions for the particular scene call for a replica of the room at Egyptian Hall, arranged to represent a Swiss chalet of actual size, *The Spirit of Mont Blanc* appearing in the rostrum L. C., through door L., as much like Albert Smith as possible:

Spirit of Mont Blanc: Me!
Mr. Buckstone: You—who are you?
S.: The Spirit of Mont Blanc.
To witness my ascent has now been long
The fashion.
B.: True: but then that's not a play.
Fortune: No, it's an entertainment.
B.: In its way.
S.: I hope I'm not in yours at any rate.
B.: What do you mean, sir, to insinuate?
S.: Nothing; I mean exactly what I say.
I hope I'm not in anybody's way.
I struck out for myself a path quite new,
And have succeeded, may you do so, too.
B.: Mont Blanc's a noble mountain, sir, your hand,
I've often heard how very high you stand,
And have no doubt you'll keep your proud position.
S.: I've gained the summit, sir, of my ambition.

MOUNTAIN DHU, at the Adelphi in December, 1866, was a burlesque of the "Lady of the Lake," while in successive years there appeared topical versions based on *Linda.* LINDA DI CHA-

MOUNI; OR, THE BLIGHTED FLOWER, a burlesque by Conway Edwardes, was given at the Bath Theatre Royal, February 20th, 1869. On September 13th of the same year LINDA DI CHAMOUNI; OR, NOT A FORMOSA opened at the Gaiety Theatre. Produced at a time when pirate depredations brought the island of Formosa into the news, it was described as "An operatic incongruity in three scenes and a sensation . . . proceeding from the pen of Mr. Alfred Thompson. In treating the subject, the adapter has departed widely from Donizetti's opera . . . the incidental music is capitally sung, and dances briskly executed . . . the costumes are exact and brilliant, and the scenery is superb. The range of the Alps, painted by Mr. Gordon, is particularly striking."

We come at last to classic MONSIEUR PERRICHON, beloved of Cercles Français down to the present time. By Eugène Marin Labiche and Éduard Martin, it was first produced at Paris in 1860 and introduces *Perrichon,* that amusingly pompous fellow, who sums up his smug self in the declamation: C'est ça . . . moi et le Mont-Blanc . . . tranquille et majesteux!" The English adaptation, entitled MONT BLANC, was presented at the Haymarket, May 25th, 1874, a comedy by Henry and Athol Mayhew, which ran for three weeks, Mr. Buckstone taking the leading part. "The work is of the first order, and not a little ambitious in its treatment. Part of the plot is derived from 'Le Voyage de M. Perrichon.' The scene is on or near Mont Blanc, and the action that of tourists engaged in its ascent. Among them is one Mr. Chirpey, a London oil and Italian warehouseman, who seeks to place a bill of his 'persuasive pickles' with the corresponding engravings on the summit of the famous mountain. . . The new scenes by Messrs. O'Connor and Morris are well painted and set."

It is not difficult to trace additional foreign productions of far earlier date. The ancient plays of the local peasant theatres were chiefly religious (mysteries) or historical. R. Töpffer in his *Noveaux Voyages en Zigzag* (1853; 16th day of the 'Voyage autour du Mont Blanc') mentions the tragi-comedy L'OMBRE DE STAUFFACHER, given at Geneva in 1584, and a play based on the life of William Tell presented at Zug, September 14th-15th, 1672. The earliest known TELL performance took place in Canton Uri shortly after 1511, and a version based on Schiller's drama is still given regularly during the summer at Altdorf. Töpffer lists by title (from the *Conservateur Suisse*) plays given in the Valais and elsewhere

in Switzerland during the seventeenth century. He and his schoolboys witnessed the outdoor production of ROSA DE TANNENBOURG at Stalden, September 4th-5th, 1842, Töpffer making amusing sketches of theatre and audience, which included J. D. Forbes, then returning from his tour of Monte Rosa (*Travels in the Alps,* 354).

Grand-Carteret (*La Montagne à travers les âges,* ii, 279) speaks of the comic operas LA VALLÉE SUISSE (1812), LA BERGÈRE SUISSE (1853) and LES DEUX PETIT SAVOYARDS, by Marsallier and Dalayrac, all presented at Paris.

Among the best-known of German dramatic writings with Alpine theme are the following: Goethe, JERY UND BÄTELY; Ludwig Ganghofer, HERRGOTTSCHNITZER; Fr. Kranewitter; ANDRE-HOFER; Jos. Ruederer, DER SCHMIED VON KOCHEL; Max Schmidt, AUSTRAGSTÜBERL; Jos. Weigl, SCHWEIZERFAMILIE; and Zach. Werner, DER 24 FEBRUAR.

Highly amusing and suitable for amateur presentation is the operetta in one act, L'ASCENSION DU MONT BLANC, by Pericaud and Delormel (St. Beuve), with music by Frank Beraldy, which was presented for the first time at the Eldorado, in Paris. The characters are *Barbillon* (M. Urbain) and *Pétunia* (Mlle Duparc), his wife. The stage represents a salon.

Barbillon has married *Pétunia,* a peppery lady to allow his friend, *Isidore* (her former lover), to escape. *Isidore* is meanwhile hiding away at rue Rochefort, 37 *bis,* but is said to have perished on Mont Blanc.

Barbillon

Nous étions arrivés au sommet du Mont-Blanc,
Isidore admirait ce spectacle sublime;
Quand vint à voltiger sur cette haute cime
Un petit papillon dont l'aile était d'argent.
Isidore, rempli d'audace,
S'élance alors pour l'attraper;
Mais soudain l'insensé, venant a trebucher,
Pique un tête dans l'espace.

Pétunia

Horreur! horreur! horreur! Quel trépas effrayant!
Ah! mon pauvre Isidore! . . .

Barbillon

Je crois le voir encore . . .
Pendant que dans l'abime il roulait vivement,
Il m'a dit: 'Barbillon, va chez ma fiancée,

Console-la
Et dis à Pétunia
Qu'elle eut ma dernière pensée.'

Pétunia

Vraiment! c'est en roulant qu'il vous a dit ça?

Barbillon

Il m'en a mêm' dit plus long qu'ça!

Barbillon, expecting *Pétunia* to commit suicide, substitutes sugar for the rat-poison, luckily for himself as *Pétunia* promptly puts it in his tea in the belief that he (*Barbillon*) has pushed *Isidore* off the mountain. The truth comes out and *Pétunia* rushes off to punish *Isidore,* only to find that he had left for parts unknown. Reconciliation between *Pétunia* and *Barbillon,* who depart for a honeymoon in Switzerland—and an ascent of Mont Blanc.

Of passing note are THE MOUNTAIN DEVIL, at the Surrey, March 26th, 1879; and VOYAGE EN SUISSE, at the Gaiety Theatre, March 27th, 1880, in three acts and five tableaux, adapted from the French by Robert Reece, and revived as THE SWISS EXPRESS at the Princess Theatre, December 26th, 1891, a pantomime farce by A. W. Gilbert and Charles Renad. THE ALPS, offered at Cambridge, June 2nd, 1886, was a farce in three acts adapted from *Perrichon;* while ALPINE TOURISTS, a comedietta in one act by Newton Phillips, was given at Ladbroke Hall, January 24th, 1888.

Members of the American Alpine Club, whose climbing careers began thirty or more years ago, will remember THE MOUNTAIN CLIMBER, a farce in three acts by Cosmo Hamilton, derived from the German of Curt Kraatz. After a successful run in London, where it opened at the Comedy Theatre, November 21st, 1905, it was brought to New York. There it was put on at the Criterion Theatre, March 6th, 1906, with Francis Wilson and May Robson in the leading parts. The hilarious plot recounts the adventures of Mr. Montagu Gibsey, given to periodic visits to Paris (where he poses as a bachelor), allowing his wife and daughters to believe that he has been mountaineering in Switzerland. To facilitate this deception he has written letters home copied verbatim from a book about the Alps. His wife overjoyed at her husband's bravery publishes these in a little volume, and insists that he repeat his heroic actions before the family and friends. Before a reporter and a photographer he demonstrates his prowess on a peak made of

all the parlor furniture. To make matters worse he is brought face to face with the man whose book he has cribbed, and it is further expected that he will make an ascent which no explorer has hitherto been able to accomplish.

The opera, LA WALLY, by Alfredo Catalani, produced in Milan in 1892, might well have served as inspiration for A. E. W. Mason's classic, *Running Water,* and has retained its popularity with Italian audiences. The libretto by Luigi Illica unfolds its story against the background of the Marzell and Similaun (Eastern Alps). *Wally* is a peasant maiden with two suitors, one of whom makes her believe that the other—whom she really loves best—is false. This turns her love to hate, and she plots with the scheming suitor to kill the other by throwing him into a crevasse. He bungles the job, and the repentant maiden rescues the victim, realizing that she loves him; but in the final act he is swept to death by an avalanche, into which she throws herself to die with him.

The opera was given August 18th, 1935, at Breuil, 8000 people flocking to the amphitheatre from the Piedmontese provinces and beyond. This was the first time that outdoor opera had been given at such an altitude (6601 ft.). "The stage with its church and chalets depicting an alpine village square, slopes on one side into an expanse of meadow and pine grove, and on the other borders a real lake, the Lago Azzuro, whose waters mirror the surrounding cliffs—the Jumeaux, the Dent d'Herens, the Giomein—topped by the towering mass of the Matterhorn." The two performances were under Alfredo Zietti's baton and Mario Dupraz's stage direction, the Scala cast being supported by the orchestra, chorus and ballet of the Teatro Regio of Turin.

Much of this happened long ago, but it indicates sufficiently that modern productions such as MUSIC IN THE AIR and WHITEHORSE INN, delighting us with their Alpine settings, are but an improved satisfaction of an old nostalgia for the mysterious beauty of mountains and the happiness of foreign travel, expressing themselves in Alps across the footlights as substitutes for reality.

And so, as the curtain falls, one can only admit that, as in Albert Smith's "Complaint of the Foreign-Office Clerk,"

> "I lost myself in visions bright,
> Day-dreaming of the treat,
> To be with you at Chamouni,
> Away from Downing-street."

PROCEEDINGS OF THE CLUB

SECRETARY'S ANNUAL REPORT
Year 1939

Once more our total membership has made a small net gain during the year to a new high. Three Active Members have died: Dudley L. Wolfe, Edmund G. Oliver, and Winthrop B. Greene; and also two Honorary Members: Professor A. P. Coleman and Brigadier-General Hon. C. G. Bruce. One member resigned. To Honorary Membership we have elected William H. Jackson, still hale and hearty at the ripe, young age of ninety-six, pioneer photographer, explorer, mountain climber and artist, who was with the Hayden survey parties in the early 70's in western United States after active service in the Civil War. Twelve Active Members have been elected. There were at the end of the year 11 Honorary and 242 Active Members.

Three meetings of the Board of Directors have been held: on January 14th, May 20th, and October 27th.

The eleventh annual issue of the Journal, completing the third volume, appeared in March under Dr. Thorington's editorship. A third edition of *A Climber's Guide to the Rocky Mountains of Canada,* which has been prepared by Dr. Thorington, will appear about March 1st, and was offered gratis to members who applied within a specified period. It will be available from the Club to members at $2.50, and to others at $3.00. The account, in book form, of the first American Alpine Club expedition to K2, 1938, appeared in the late fall under title *Five Miles High,* edited by Robert H. Bates, with the chapters contributed by four members of the party: Bates, Burdsall, House, and Houston.

The Library and Map collection, in charge of Miss Buck and Wood respectively, continue to grow bit by bit.

On May 19th an informal dinner, attended by about fifty members and guests, was held in New York. Afterward there was an illustrated talk on the recent successful expedition to the Sierra Nevada de Santa Marta in Colombia, in which four members (Cabot, Wood, Bakewell, and Hall) had taken part.

Late in August your Secretary had an opportunity to meet a dozen or more of our California members and several members of the Sierra Club through the kind invitation of Francis Farquhar and Bestor Robinson at the latter's home in Berkeley. Among pictures shown was a film of the first ascent of the Higher Cathedral Spire in the Yosemite in 1934 by Robinson, Eichorn and Leonard.

In the field our members have continued active. In March there was the first ascent of the highest peak of the Sierra Nevada de Santa Marta (18,770 ft.) by Wood, Bakewell and another. The Second K2 Expedition, participated in by five members—Wiessner, Cromwell, Wolfe, Durrance and Cranmer, and George Sheldon of the Dartmouth Mountaineering Club—reached a new high altitude on the mountain of some 27,400 ft. on July 21st, by a continuation of the route worked out by the 1938 party, but resulted in the unfortunate death of Dudley Wolfe, probably near Camp VII at an altitude of almost 25,000 ft, and of three gallant Sherpas in their courageous attempt to bring him down. In the Wind River Range, Wyoming, both Bonney and Mr. and Mrs. Robert L. M. Underhill made first ascents. In the Coast Range of British Columbia, Gibson, Hendricks, and Hall made several first ascents including Mt. Tiedemann (*ca.* 12,900 ft.) close to and second only to Mt. Waddington in height in this still largely virgin area. In Yukon Territory, behind Mt. Logan, Wood continued his air and ground surveys and explorations, accompanied by Mrs. Wood and Bakewell. A prolonged attempt to climb Mt. Wood failed in storm. A party led by Bestor Robinson finally made the first ascent of the very difficult Shiprock in New Mexico early in October, a fine feat despite the use of what has been called by some old-school climbers, "adventitious aids," but without which it probably would not have been done at all.

HENRY S. HALL, JR.,
Secretary.

ANNUAL MEETING

The 37th Annual Meeting of the Club* was held at the American Geographical Society, Broadway at 156th Street, New York, on January 13th, 1940, at 2.15 P.M. President Rogers presided,

* No Annual Meeting was held in 1918.

and there were forty members present. A few members and guests came in afterwards for the speaking program. The Minutes of the previous Annual Meeting and the Secretary's Annual Report were read by the Secretary and voted approved.

Fisher read his report as Treasurer with comments (printed elsewhere). Due to several unusual items of receipt and expenditure these totals were much larger than usual. A surplus for the year is shown due to skillful management by the Treasurer. The average amount of dues paid was about nine dollars. The ratio of ten to five dollars dues was about three to one. A number of members voluntarily paid fifteen dollars.

Miss Helen I. Buck read her report as Librarian, showing accessions of 54 books and a total of 3380 bound volumes. Thorington had donated many books and a fine relief model of K2. Several current books were purchased, and some use was made of the circulating privilege by members living away from New York. Mr. Rogers spoke appreciatively of Miss Buck's continued devoted work for the Club, work which is perhaps too often taken for granted, but the absence of which would soon become only too apparent in the Library were it to be neglected for even a short time.

Wood stated that the Map collection started two years ago now contained a complete series of Swiss and Italian maps and the French maps from Mt. Blanc and the Maritime Alps to the Mediterranean. He referred to the work of the American Geographical Society on the millionth scale map of South America, and said that the A. G. S. has made available a complete set of these sheets to the Club.

Hall said that 170 members had replied to the request for lists of their 1939 climbs, of whom 62 (26 per cent of the active membership) reported actual climbs made during the year. This information will be included in the new Club book to appear this spring.

Henderson summarized the work of Schurman's Committee on Guide's Training, describing the training course. Christine Reid said that the experience of the guides on Mt. Rainier is very limited, but said also that Schurman's committee had done good work in coordinating various groups interested in properly conducted climbs of Rainier. President Rogers said that eight Seattle members were going to meet that evening and asked the Secretary to wire greetings from the Annual Meeting.

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President Rogers spoke of a letter which he had written to Director Cammerer of the National Parks Service in regard to the annoyance caused to climbers by the one dollar fee imposed by the Park authorities for the ascent of Rainier, and said that a reply from Mr. Cammerer received that morning stated that in view of this and other protests the fee was to be abolished. He then called on Mr. Edmund Rogers, Superintendent of Yellowstone National Park, who had come up from Washington representing Mr. Cammerer. Superintendent Rogers spoke of the difficulties encountered in steering a middle course, between allowing unrestricted climbing by incompetent, poorly equipped parties, and prohibiting all climbing where accidents might possibly be expected to occur. The Superintendents have complete authority. The question for them is, how to exercise it with moderation and in fairness to all (accidents may well involve risks for rescue parties manned by members of the Parks' staff. He read a memorandum from the National Parks regulations as follows:

Sec. 2. 33 *Hazardous ventures.* (a) Hazardous ventures, such as ski touring, glacier travel, wilderness exploration, or mountain, crater, cliff, or canyon climbing, off established trails, or boating upon or otherwise attempting to navigate rapid waters, will be permitted upon compliance with the following conditions:

(1) All participants shall register with the superintendent or his authorized representative, both before and after each venture.

(2) All participants shall qualify by training, experience and physical condition, shall have competent leadership, and shall show that provision has been made for adequate equipment, clothing, food and supplies.

(3) Solo climbing of mountains which are designated by the superintendent as being particularly hazardous is prohibited except with the written permission of the superintendent.

(4) When the superintendent deems such action necessary, due to special conditions, he may prohibit any or all hazardous ventures.

The above is the attempt, as it now stands, to regulate the taking of risks in the Parks. Fuller moved that the new regulations be considered acceptable by the Club. Bonney was afraid the superintendents were given too much power. Gilmour thought it necessary that superintendents should have some such power. Howorth and Spadevecchia said that ability to judge climbers' qualifications varied with different superintendents. Washburn thought the new regulations about as good as possible. President

Rogers said that the Club had not been able to suggest definite qualifications for climbing parties to the Parks Service, and that if any superintendent is unreasonable it would soon be possible to report him to Washington. Truslow questioned codifying superintendents' powers, to which President Rogers answered that the above was an attempt to make uniform regulations for all Parks, so that climbers could know what to expect in advance, and that in any event Park superintendents had absolute authority—it was more a question of arriving at some uniform exercise of this authority insofar as it affected climbers. A *motion* proposed by Fuller, and seconded: that we approve the regulations, thank the National Parks Service for their cooperation in the whole matter, and assure them of the Club's cooperation in the future, was unanimously *passed.*

Field reported for the Nominating Committee (Peabody, Chamberlin, and himself, chairman) the names of Howard Palmer and H. Bradford Washburn, Jr., as Councillors for the three-year period, 1940-1942, and expressed thanks to Henderson, the retiring Councillor, for his interest and active work for the Club. Motion by Fuller, instructing the Secretary to cast one ballot for all other continuing Officers and Councillors was seconded and passed.

The meeting adjourned at 3.40 P.M.

Immediately after the Annual Meeting the following illustrated talks were given:

First Ascents (including Mt. Tiedemann, 12,900 ft.) in the Coast Range of British Columbia, illustrated with lantern slides, by Sterling B. Hendricks.

Manless attempt on Mt. Confederation, Canadian Rockies, illustrated with colored lantern slides, by Miss Christine L. Reid.

First Ascents of Titcomb Needles and Peak G-16 with pack trip in Wind River Mountains, Wyoming, illustrated by colored movies, with musical sound accompaniment, by Orrin H. Bonney.

ANNUAL DINNER

The Annual Dinner was held the same evening at the New York Junior League, 221 East 71st Street. There were 175 present: 72 members and 103 guests, including Mr. Edmund Rogers, Superintendent of Yellowstone National Park, a younger

brother of President James Grafton Rogers who presided. This attendance was the largest in the Club's history.

After dinner President Rogers cordially greeted the large gathering and referred to several absent members including our former President, Dr. Nichols, who is spending the winter of his ninetieth year in the heart of the White Mountains. The Secretary read letters of greeting and regrets at their absence from our members, J. W. A. Hickson in Montreal, and Arthur O. Wheeler, Honorary President of the Alpine Club of Canada, from Sidney, Vancouver Island.

O. Eaton Cromwell showed the colored slides and moving pictures taken by several members of the 1939 expedition to K2. Particularly impressive were many views of the stupendous peaks towering above the Baltoro Glacier, incomparably the grandest mountain group in the world.

Walter A. Wood, Jr., showed fine colored movies taken by Mrs. Wood, of his third expedition to the St. Elias Range, Yukon Territory, 1939. From Burwash Landing on Kluane Lake, the party went westward by pack-train into the mountains where bad weather (four fine days in fifty-two) severely handicapped the survey work and turned back an attempt on Mt. Wood at 14,000 ft. from a camp at 10,300 ft. Three flights over the range were made for survey purposes. Much laughter greeted the return by Wood to Washburn and Bates of suits of underwear discarded by them after their ascents of Lucania and Steele in 1937 and retrieved from beside a stream by the 1939 party. The well-taken pictures gave a vivid impression of the color and majesty of this magnificent range of mountains.

HENRY S. HALL, JR.,
Secretary.

REPORT OF THE TREASURER

Receipts to December 30, 1939:

Dues, 192 members (including advance dues of $50)	$ 1,885.03	
Interest and dividends	260.00	
Sales, guide books	13.00	
Sales, other books (including Hitchcock and Cushing)	266.75	
Sales, back numbers of American Alpine Journal	43.51	
Profit on (part of)* securities purchased and resold within year: 200 Boston & Providence R. R.; 100 Nashville Chattanooga & St. Louis R. R.; 100 Francisco Sugar Co.	1,376.91	
		$ 3,845.20

Disbursements:

Room rent and upkeep		$ 1,168.28	
Guide Training Committee		55.50	
K2 Expedition, expenditure	$13,235.67		
Less receipts	12,153.00		
		1,082.62	
1939 American Alpine Journal	$ 1,522.50		
Less sales current numbers and underwriting advertising	727.34		
Less advertising receipts	189.70		
		605.46	
Miscellaneous, postage, printing, etc.		277.02	
Additional reserve (now 600) for Club booklet		300.00	
			$ 3,488.92
Excess receipts over disbursements			$ 356.28

Reconciliation:

Balance, Chase National Bank, 1/1/39:			
General account		$ 604.85	
Map account		200.00	
Booklet reserve		300.00	
			$ 1,104.85
Receipts			3,845.20
			$ 4,950.05
Disbursements 1939 (before reserves)			3,188.92
Balance, Chase National Bank 12/31/39:			
General account		$ 961.13	
Map account		200.00	
Booklet reserve		600.00	
			$ 1,761.13

Assets, 12/31/39:

Cash balances, Chase National Bank		$ 1,761.13	
Brooklyn Savings Bank:			
Whymper Fund		216.39	
Library Fund		295.62	
Reserve Fund		746.64	
Club House Fund		5,298.98	
			$ 8,318.76

Securities at Cost:

Reserve Fund:			
1 U. S. A. 4, 1944		$ 1,103.33	
Club House Fund:			
1 Nor. Pac. 4		866.36	
1 Sou. Pac. S. F. T. 4		829.61	
Bond & Mort. Co. Gtd. mtg. ctf.		3,000.00	
Lawyers Mort. Co.		3,000.00	
10 General Gas Elect. pfd.		991.67	
			$ 9,790.97

* Balance of profit from sale of those securities was applied to underwriting of the cost of advertising and publishing a larger edition of the Journal in 1939.

Inventory of Club Room (not included above):

Library, approximately 3000 volumes, cost	$ 1,014.19
Furniture and book cases	$ 563.32
Estimated value of donations included above	$ 8,000.00

Contents of rooms insured for $9,000 (fire), $100,000/300,000 public liability insurance carried as to issuance of diplomas to guides.

JOEL E. FISHER,
Treasurer.

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REPORT OF THE LIBRARIAN

During the past year fifty-four books, chiefly donations by Dr. Thorington, were added to the library, making a total of 3380 bound volumes; twelve books of current interest were purchased and a few were received from publishers. The club also received a relief map of K2, made by Dr. Thorington from the Spoleto map. In addition to much unbound material, various members have sent in reprints and duplicate journals. Through the kindness of Mr. Fisher, the author card catalogue has been brought up to date. Members residing outside the New York area have availed themselves of the opportunity of borrowing books from the collection, according to the rules adopted last year.

HELEN I. BUCK,
Librarian.

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COMMITTEE ON DISTRESS SIGNALS

This committee has continued its activity during the past year and has supplied various organizations throughout the country with placards for posting in public places.

No new fields, however, have been opened up, but it is planned to conduct an educational and publicity campaign during the coming year.

KENNETH A. HENDERSON,
Chairman.

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GUIDES' COMMITTEE

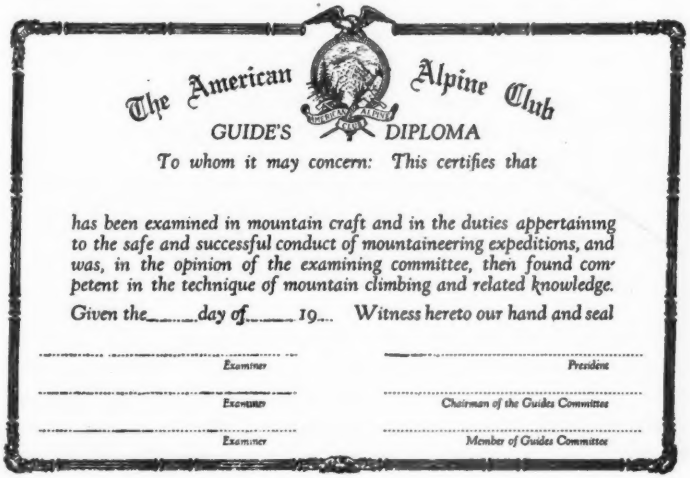
This committee continued active during the past year and we are very pleased to report that its activities have borne fruit in providing an improved guide service in the Pacific Northwest.

Mr. Clark E. Schurman, committee member in Seattle, was able to hold an instruction course during the winter of 1938 and 1939 which was climaxed by a week's trip around Mt. Rainier where the candidates were given an opportunity to practice and display their mastery of the principles of mountaineering. As a result of this, the following five men received guides' diplomas:

Bruce B. Smith, Portland, Oregon
James L. Wortham, Los Angeles, California
Lyman A. Boyer, Seattle, Washington
Leslie M. Yansen, Tacoma, Washington
Robert J. Hoxsey, Seattle, Washington

An assistant guide card was granted to Robert W. Jamison of Seattle, Washington.

In addition the other members of the committee gave a guide's diploma to Clark E. Schurman, our industrious Seattle representative, who was asked to take charge of the guide service at Mt. Rainier National Park this last summer. We are glad to report that the service was well conducted and received by the public. Many new inovations were carried out and a high percentage of success in the summit climbs obtained. In addition, one of the men was sent to Mt. Baker to assist in the rescue work and recovery of bodies in the accident which took place there last July.



The American Alpine Club

GUIDE'S DIPLOMA

To whom it may concern: This certifies that

has been examined in mountain craft and in the duties appertaining to the safe and successful conduct of mountaineering expeditions, and was, in the opinion of the examining committee, then found competent in the technique of mountain climbing and related knowledge.

Given the_____ day of_____ 19____ Witness hereto our hand and seal

Examiner — *President*

Examiner — *Chairman of the Guides Committee*

Examiner — *Member of Guides Committee*

REDUCED FACSIMILE OF GUIDE'S DIPLOMA

The work of this committee appears to be bearing fruit and it is planned to continue along these same lines during the coming year. Mr. Schurman has again been asked to manage the guide service at Mt. Rainier and present plans call for a short practical course for guides early in the year. The guide service, plans in connection with the Mt. Rainier National Park Company, to run four other courses which will be open to those who wish to obtain a better technical knowledge of mountaineering and related activities. A guide training expedition is planned for a period from July 27th to August 11th or 12th in the Mt. Rainier National Park. This will be open to young men over seventeen years of age, of high character reference, who are anxious to become guides eventually or who will agree to teach climbing and camping in their own cities and schools.

In addition, three other courses of a less strenuous character will be open to the general public.

1. The fellowship vacation of eight full days with guides giving instruction classes and trips.
2. A week-end climbing course of six lessons, four evenings in classrooms followed by a day afield on the glaciers and mountains of the parks giving experience in camping and bivouacking.
3. A welfare vacation for juvenile character agency groups, schools, etc., having their own leaders, parental or bus transportation, clothing, bedding and utensils. This will be held at a nominal cost and strict supervision will be followed.

Although no courses entirely related to the training of guides have been held in the Rocky Mountain area, it is pleasing to record that the Colorado Mountain Club at its annual camp this last year devoted almost its entire time and attention to the training of attending members in the principles of mountaineering. This is a tendency which should certainly be encouraged in the future.

KENNETH A. HENDERSON,
Chairman.

IN MEMORIAM

ARTHUR PHILEMON COLEMAN
1852-1939

Many years ago the American Alpine Club honored itself by electing to honorary membership Professor Coleman. Not only did the Club bring into its fold an explorer and ardent lover of mountains, but a preeminent scientist and man of remarkable personal charm as well. Primarily he was a geologist, but his love of Nature in her wilder aspects was such a ruling passion that many a summer he slipped away from sober science to explore remote parts of the Canadian Rockies. Of course, he had certain objectives, but the sheer enjoyment of the hours spent in camp, in struggles with the rivers, moving through the forests, as well as in the actual climbing of the mountains, had for him an irresistible appeal. One wonders if these were not the happiest hours of his long, successful, and unusually happy life.

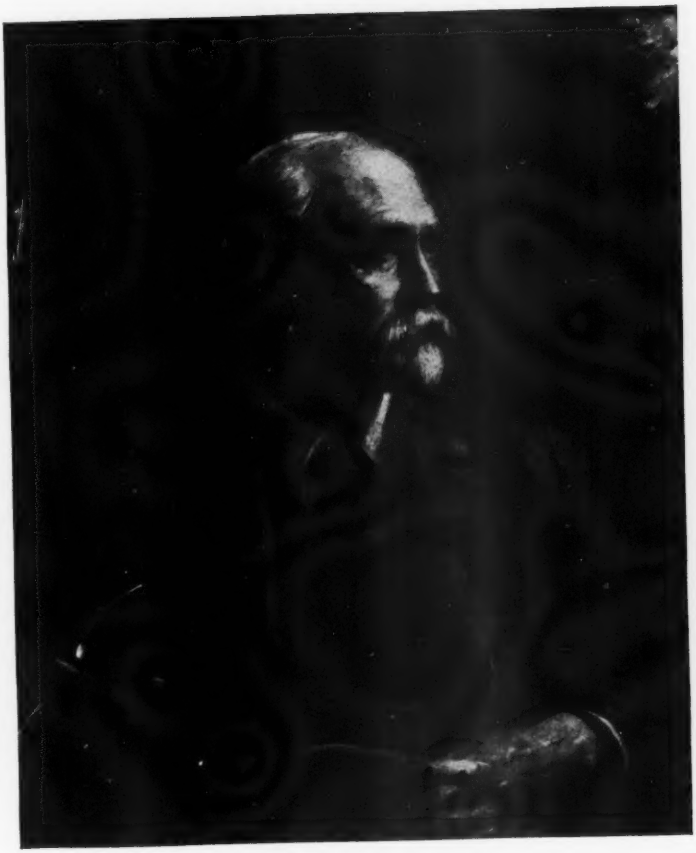
He was a painter of beautiful landscapes which he often gave to companions who naturally prized them highly. Several of his paintings may be seen in the Royal Ontario Museum. Students have been known to say that Professor Coleman made a deeper impression on them than anyone else with whom they came in contact. This is not so strange, perhaps, for blended together in one was the scientist of the first water, the artist, picturesque speaker, and simple, friendly, unaffected gentleman of the old school. Sir John Flett, for many years the distinguished director of the Geological Survey of Great Britain, once wrote that he considered Coleman not only one of the greatest living geologists, but one comparable also to the great geologists of the past.

Arthur Philemon Coleman was born at Lachute, Quebec, on April 4th, 1852. His father was a Methodist minister and on his mother's side he was a descendant of John Quincy Adams. For a time he taught school and then entered Victoria University at Cobourg, from which he graduated in 1876, receiving the gold medal established by Queen Victoria for general proficiency. Like many Canadians at that time he went to Germany for graduate study and obtained the degree of doctor of philosophy from Breslau in 1881. Returning to Canada, he was appointed professor of natu-

ral history in his alma mater, serving in that capacity until the federation of Victoria with the University of Toronto. In 1891 he was made professor of assay and metallurgy in the School of Practical Science and ten years later became professor of geology and head of the department in the University of Toronto, which position he held until his retirement in 1922 as professor emeritus at the age of seventy. From 1919 until he retired, he served as dean of the faculty of arts, and from 1914 as director of the Royal Ontario Museum. For many years he was a member of the staff of the Ontario Bureau of Mines.

Coleman was one of the few remaining representatives of the older generation of geologists who got their start before the science had differentiated into its present sub-fields. His contributions were very wide in scope, and the accomplished results were of prime importance. His notable investigations of the now-famous Sudbury nickel area, in particular, have called forth high tribute from geologists and mining men alike. The field work was done in the absence of roads and without even trails through much of the wilderness; nor could a canoe be used to advantage as it can in many other parts of Ontario. Nevertheless, his map and the rock series which he worked out have stood the test of time. Today the area produces far more nickel than all the rest of the world combined, and his early deciphering of the geologic history of the region from its complicated rock structures has contributed greatly to our present understanding of the Canadian Shield as a whole.

In quite another line was Coleman's discovery of the glacial origin of the Cobalt conglomerate, deposited well over a half billion years ago when the earth's climates were supposed to have been decidedly warm. This led him into a long succession of critical studies of ancient glacial deposits on all the continents except Antarctica. His very readable *Ice Ages, Recent and Ancient,* brought out in 1926 after nearly world-wide travels, is the standard publication in this field. With advancing years there was no waning of enthusiasm. Even after passing the four-score mark, he utilized our northern winters for two expeditions to the Andes of Colombia and three to the high mountains of southern Mexico and Central America to round out his studies of Pleistocene glaciation within the tropics; the summers found him back at work in Ontario.



ARTHUR PHILEMON COLEMAN
(1852-1939)

DUDLEY FRANCIS WOLFE
(1896-1939)

Photo, Blackstone

Coleman's mountaineering was mostly of the pioneering sort in which exploration was more of an objective than solving technical problems of climbing for their own sake. With a few hardy and enthusiastic companions of no great climbing experience he pursued many routes through poorly known portions of the Rockies between 1884 and 1908. One may read with much enjoyment his vivid portrayal of the struggles, failures, and accomplishments of these various expeditions in his book *The Canadian Rockies, New and Old Trails* which appeared in 1911. The supposedly very lofty Mts. Brown and Hooker were the rainbow at the end of several of these trails till their grandeur became a myth of the past in 1893. In 1907, and again in 1908, the lure was Mt. Robson, upon which apparently no white man had previously set foot. Though his several attempts on the peak were defeated, they stimulated others which before long achieved success.

Probably few people have had a keener appreciation of the beauty of mountains than Professor Coleman. Some years ago at the high bivouac on Orizaba, while the younger and presumably more vigorous members of the party were conscious chiefly of their fatigue and the penetrating chill, Coleman was observed feverishly at work with his paints trying to preserve the sunset tints fast fading from the snowy cone. A water-color sketch of his is probably the earliest picture which we have of Mt. Waddington.

The geological profession has conferred its highest honors on Doctor Coleman. He held honorary membership in the English and American Alpine Clubs. One of the original members of the Alpine Club of Canada, he was vice-president in 1906-8 and was its second president, 1908-14. At eighty-six the splendid old gentleman was preparing for a winter trip to British Guiana and planning a summer visit to Mt. Coleman in the Canadian Rockies. But these unfortunately were not to be, for he was taken ill at his desk and, after three weeks, died on February 26th, 1939.

R. T. C.

DUDLEY FRANCIS WOLFE
1896-1939

Dudley Francis Wolfe was born in Irvington-on-Hudson, New York, February 8, 1896. He disappeared on K2 in the Karakoram Himalayas, in the vicinity of Camp VII, with three Sherpa porters

approximately July 31st, 1939. No trace of the missing party has yet been discovered.

He attended Pomfret School, Pomfret, Connecticut, and Andover Academy in the class of 1918, playing on the varsity football team of the latter school. He was a member of P. B. X. Society there. He did not graduate from Andover, going overseas September, 1917, as a member of the Mallet Reserve Transport Service of the French Army. In 1918 he went to Italy with the American Red Cross and there drove an ambulance for the Italian Army. He was decorated at that time with the Italian War Cross, an equivalent of the French Croix de Guerre. Later in 1918 he enlisted in the French Foreign Legion and was in training when the war ended. His shortsightedness made it impossible for him to enter any of the regular United States services.

After his return to the United States he went to Harvard University, graduating in the class of 1929. He played on the varsity football squad and was a member of the Owl Club. Sometime after graduation he became interested in yacht racing and was the owner of several noted racing yachts. Among other events which he took part in were the Transatlantic Race to Santander, Spain, in 1931, in his schooner "Mohawk" and competed in the Fastnet Race to England the same year. In his racing cutter "Highland Light" he took part in the Race to England (1933), the Gibson Island Race (1933 and 1937), and in 1938 he won the Findley Trophy for first boat to finish in the Bermuda Race. He also made several big game hunting trips in the Alberta district of the Rocky Mountains about this time. About 1933 he became interested in skiing, beginning in the famous Hans Schneider's classes at St. Anton in the Arlberg. He became adept and won various prizes and made many winter tours in Switzerland, France, and Austria. The resulting acquaintance with Otto Fuhrer led him to go in for mountaineering as well. In the company of this noted guide who was twice F. I. S. Champion, and Elias Julen, formerly guide of the famous "Fliegender Holländer," he had several very successful seasons in the Alps, climbing in the Western Pennines, the range of Mt. Blanc, and in the Bregaglia Group of the Engadine. He made a number of the principal summits, both rock and snow peaks. Perhaps the most notable of his tours is the ski-traverse of Mt. Blanc from the Vallot Hut to the Mer de Glace.

He joined the American Alpine Club Second Karakoram Expedition and was most useful in attending to the purchase of the foreign supplies, getting in at the same time a winter season of skiing, principally around Davos. He was physically the strongest member of the party and apparently felt the rigors of life at a high altitude as little as any of us. He was a member of the Cruising Club of America; the Eastern Yacht Club; the Seawanhaka Corinthian Yacht Club; the Royal Ocean Racing Club of Great Britain; Royal Western Yacht Club of Great Britain; Exchange Club, Boston; Union Boat Club, Boston; New York Athletic Club; India House, New York City; Ski Club, Arlberg, Austria; and the American Alpine Club.

He married Alice Damrosch, daughter of the noted musician and orchestra leader.

E. C.

CHARLES GRANVILLE BRUCE
1866-1939

The death in London last July at the age of seventy-three of Brigadier-General The Hon. C. G. Bruce takes away another of the outstanding figures of our day in the alpine world. General Bruce had a great love for the mountains which began as a boy in his own Welsh hills. For Switzerland and the Swiss people he had a lifelong devotion, and that feeling was wholeheartedly reciprocated by the Swiss themselves. They considered him one of their best friends. He was an Honorary Member of the Swiss Alpine Club and also of the American Alpine Club. At the meetings of the Alpine Club in London he was always a central figure. To meet "the General" was an experience in itself as I was once lucky enough to learn. He was in "good form" that night, they said, which soon became evident as half the room gravitated about him.

He was the second son of the first Lord Aberdare, an uncle of the present peer, the famous "ball" player. Choosing the army as a career, he was commissioned a lieutenant at twenty-one and went to India the next year, where he joined the Gurkha Rifles. For the next ten years he took part in various local campaigns. The famous Gurkha Scouts he was the first to raise and train as units specializing in mountain warfare, and he eventually commanded a regi-

ment of them in the Dardanelles campaign in 1915 until severely wounded in both legs. Later he again served on the Indian frontier, and in the Afghan war, and in 1920 retired from active service. He was awarded C. B., M. V. O., and frequently mentioned in dispatches.

Service in India included leaves which he frequently used to gratify his yearnings for the high mountains. In 1892 he was with Martin Conway on a scientific expedition in the Karakoram. In 1895 he went with Mummery and Collie to Nanga Parbat, when the former with a Gurkha porter was lost on the mountain. In 1905 he had suggested to Francis Younghusband an expedition to Mt. Everest and was actually in Nepal making preparations when permission to approach the mountain was refused. In 1907 he went to the Garwhal with T. G. Longstaff and Mumm but an abscess on the knee prevented him from taking part in the first ascent of Trisul. At the age of fifty-six he led the second expedition to Mt. Everest, and was leading the 1924 expedition when illness on the way across Tibet forced him to drop out. He helped to organize the 1933 expedition as well. At this same time he was President of the Alpine Club, 1923-1925. In 1927-1930 he was President of the Association of British Members of the Swiss Alpine Club. In 1921 he took part in the opening of the Britannia Hut which was dedicated to the British members of the S. A. C. who died in the war of 1914-1918, and in 1930 as President of the "British Members" he again attended the inauguration of the enlarged hut.

On his mountain experiences he wrote four books: *Twenty Years in the Himalaya* (1910); *Kulu and Lahoul* (1914); *Assault on Mt. Everest* (1922); *Himalayan Wanderer* (1934).

In 1915 he received the Gill Memorial and in 1922 the Founders Medal (one of two highest awards) from the Royal Geographical Society, and also the Gold Medal of the Société de Géographie, Paris, in 1922.

The General was a mountaineer of the old school. He made some fifty ascents in the Himalayas. He loved the mountains for their own sake, and enjoyed expeditions to new country and new peaks. He had not had the opportunities nor perhaps the desire to indulge in the more modern feats of acrobatic climbing. His devotion to and understanding of the hill tribes made him a par-

ticular inspiration to the now famous, elite high mountain porters, the Sherpas, so invaluable to all recent Himalayan expeditions. He possessed qualities which all men, European and native, admired. His abounding sense of humor and good nature earned him the name of "Grand Sahib" among the mountain tribes throughout the Himalaya. Altogether the General was one of the cheering personalities of his generation among mountaineers.

H. S. H., Jr.

EDMUND GIFFORD OLIVER
1881-1939

In E. G. Oliver the Club loses a member who possessed one of our most distinguished records. He had climbed, as I recall it, in every major group in the Alps and had done practically all the principal summits, most of them by "fancy" routes. He made a few first rate expeditions guideless but, as he expressed it, found it difficult to gather together a sufficiently strong party for a long enough period of time to accomplish the sort of expedition he had generally in mind, and consequently travelled mostly with professionals.

At the time I knew him he was climbing with Adolf and Alfred Aufdenblatten, who were actually in his employ when his climbing career was terminated by the fearful accident to the train on the viaduct at the Montanvert (1927). His noted first ascent of the S. face of Mont Blanc in 1919 was done in company with the two Aufdenblattens, as was the passage of the Col du Lion and the Col du Tour Noir. I do not recall what guides led him over the Col du Mont Dolent, but imagine that he was the only mountaineer to have done all three passes. His ascent of the E. face of the Aiguille de Bionnassay by a variation of R. W. Lloyd's first ascent, was also done with the same men. This year (1926) he also attempted an ascent of the Col du Bionnassay, but when half way up, one of the largest ice avalanches he had ever seen actually passed over the heads of the party when halted for lunch on the lower lip of a large transverse schrund, and the expedition was forthwith abandoned. His ascent of the Nordend of Monte Rosa was done in company with Otto Fuhrer. It is perhaps needless to give a further list of his climbs other than that to be found in our Club Record Book.

Personally, though a man of considerable reserve, Oliver was a charming and lighthearted companion with a tremendous sense of humor, and one of the best read and best educated men I have ever met. He was educated at Marlborough and King's College, Cambridge, and later became a solicitor in London, enjoying a large and prosperous practice. A solicitor, of course, does a business which in this country is generally handled by a trust company. His brother was one of the most noted King's Council of the day. Oliver was a member of the Alpine Club of London, the Austrian Alpine Club, the Groupe de Haute Montagne, and a Life Member of the French Alpine Club.

E. C.

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WINTHROP BENTON GREENE
(1869-1939)

Rev. Winthrop Benton Greene died in Philadelphia on December 6th, 1939, at the age of seventy, following a long illness. A graduate of Williams College and of Union Theological Seminary, he was former assistant pastor of Second Presbyterian Church and for many years connected with the Federal Reserve Bank of Philadelphia.

Elected to membership in the American Alpine Club in 1921, at a time when qualification was not rigid, his mountaineering experience was slight. This was more than compensated for by his keen interest in the activities of his fellow clubmates, and he would doubtless have accomplished more himself had his family ties permitted. He served on several of the dinner committees, and within a short time of his death was intently reading the bulletins of the second K2 expedition.

J. M. T.

BOOK REVIEWS

Five Miles High: The Story of an Attack on the Second Highest Mountain in the World, by Members of the First American Karakoram Expedition. Edited by Robert H. Bates. 8 vo.; xii + 381, with 38 illustrations from photos, 1 chart and 2 maps. New York: Dodd, Mead & Co., 1939. Price $4.00.

There is scarcely a single mountaineer or climbing enthusiast who has not marveled at the beauty of Vittorio Sella's Himalayan photographs. One of the most impressive of these pictures is his superb study of the E. face of K2, second highest mountain in the world, seen across the deep gorge of the Godwin-Austen Glacier.

When, in the spring of 1938, the first American Karakoram Expedition sailed for India and announced this peak as its objective, experienced alpinists the world over shook their heads in knowing disapproval. Any mountain declared impregnable by the Duke of Abruzzi and his seasoned guides was no fit place for a party of youthful Americans to test their mettle. *Five Miles High* is the story of this assault on the 28,250-ft. monarch of the Karakoram Himalaya. It is a clear, brilliant account of one of the greatest assaults in the annals of mountaineering. Its sheer simplicity of description, which in places borders on understatement, carries the reader from the trials of the initial food-tasting in New York to the struggle for the last icy pyramid of K2 in far-off India.

The various chapters of the book have been written by four different members of the expedition, each tackling the part of the tale which he is best qualified to describe. The straightforward, informal style of all four authors has made the book interesting and easy reading. Robert H. Bates has not only written five engrossing chapters, but he has also done a most able job as editor of the entire volume. Its literary and dramatic peak is unquestionably reached in the closing pages of Charles Houston's chapter "Five Miles High"—I feel it unfortunate that the last two chapters could not have been used as additional material to supplement the already unusually complete and interesting appendices.

It is truly refreshing to read a book on Himalayan adventure the greater part of which has not been devoted to a lengthy and verbose account of the approach to the mountains. This is a pleasant sur-

prise, especially when one recalls that K2 is one of the most remote peaks in the entire Himalaya, being situated a good deal more than twice as far from civilization as Mount Everest. In his treatment of these early chapters Bates has used a light, jovial style, bubbling over with enthusiasm for the fascinating country on the long route to the Karakoram.

Especially to the mountaineer, the description of the actual reconnaissance and assault on K2 is intensely absorbing. This is the first account ever published of an expedition which has encountered difficult rock climbing at excessive altitudes. With a coolness and determination that can easily be read between the lines of *Five Miles High,* Houston's party reconnoitered K2, and finally attacked it by a route so difficult that the guides of the Duke of Abruzzi did not feel it even worth consideration thirty years ago.

In order to effect the epic ascent of this Abruzzi buttress, seven camps were placed on ledges and snowdrifts even an alpine chough would have found it difficult to alight upon. Living for twenty-three days above 16,000 ft. on the face of K2, sleeping in the tiny tents secured in place by pitons and rickety foundations of loose rock, the four members of the climbing party succeeded in overcoming a series of climbing obstacles, many of which would be considered exceedingly difficult even at lower altitudes.

An unavoidable shortage of food and waning good weather, on account of the length of a careful reconnaissance, were the only two factors which kept this courageous group from reaching the actual summit of K2. The resourcefulness and wisdom of Houston and his comrades are constantly apparent as one turns the pages of *Five Miles High.* It is a splendid account of a magnificent adventure.

B. W.

A Climber's Guide to the Rocky Mountains of Canada, by Howard Palmer and J. Monroe Thorington. Third edition. 12 mo.; xviii + 275 pages. New York: The American Alpine Club, 1940. Price $3.00 ($2.50 to A. A. C. members).

The third edition of this handbook of mountaineering in the Canadian Rockies, which has proved its worth during the twenty years since it first appeared, is the authors' final endeavor to correct and amplify the work already recorded, their personal observation form-

ing the basis for the revisions and additions of the new edition. The total number of peaks included is approximately 750, with more than 600 routes outlined. Passes to the number of 95 are described. The general grouping of peaks remains the same as in earlier editions, the eastern frontal range warranting an additional section S. of the Canadian Pacific railroad.

The arrangement is progressive from S. to N. Part One includes the peaks from the International Boundary to the main line of the Canadian Pacific railroad; Part Two extends the description to Yellowhead pass, crossed by the Canadian National railroad, while Part Three embraces the region as far N. as Jarvis pass, beyond which the mountains are less typically alpine.

From areas recently surveyed more than eighty new peaks have been added to this edition, while mountaineering since 1930 has necessitated the inclusion of 107 first ascents and sixty-seven new routes, much material appearing here for the first time. The Lake Louise-Jasper highway, opened throughout in 1940, is described and affords limited access to several hitherto remote groups.

With its companion work on the Interior Ranges of British Columbia (1937), the two volumes form the American Alpine Club's chief contribution toward the preservation of North American climbing records. The authors' diligence is in marked contrast to that of the Geographic Board of Canada, which has failed to solve the obvious problem of nomenclature for the many important unnamed peaks in areas long since covered by governmental surveys.

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Peaks and Lamas, by Marco Pallis. 8 vo.; 423 pages, with illustrations and maps. London: Cassell & Co., 1939. Price 18*s*.

Subjectively the account of two Himalayan expeditions in 1933 and 1936, including the ascent of Riwo Pargyul (22,210 ft.) and Central Satopant'h Peak (20,060 ft.), N. E. of Simla and an attempt on Simvu (22,360 ft.) near Siniolchu, and extensive journeys over the divide beyond Simla, Darjeeling, and in Kashmir; the greater part of the book deals with the intimate contact of the writer with the lamas of several of the Buddhist monasteries visited, a contact made possible by the writer's command of Tibetan. In almost every account of expeditions to the Himalayas, passing reference is

made to these monasteries met en route, and while the expeditions are sometimes entertained by these lamas, the reader generally derives the impression that they are difficult to approach, ignorant and dirty, and at best are to be jotted down in the diary as curiosities that were endured rather than enjoyed.

But here is a book that has enough climbing description, and certainly enough excellent illustrations, to appeal to any member of the Club but, far beyond that, the book portrays these lamas as deep thinking, unbigoted men, genuinely following a religion that has much in common with Christianity, whose tradition is, if anything, more sincere and centuries older. The insight into the fundamentals of this great Buddhist religion, centering on knowledge and compassion, and the open-mindedness with which its lamas welcome comparing its traditions with Christianity, is a most interesting subject to anyone, and particularly to our members, now that two American expeditions have recently followed part of the very route which is covered by one of Pallis' journeys. Living descriptions of many aspects of the countryside and its inhabitants abound; while the expressions by which the author translates into English the abstract doctrines of Tibetan Buddhism are sometimes a bit difficult to grasp immediately—The Wheel of Existence, Action; Anger, Desire—Attachment, Ignorance; Suffering; Cause of Suffering; Cessation of Suffering; Truth and Enlightenment; Knowledge and Just Views; Compassion; Liberation—such headings cannot fail to suggest to anyone philosophically inclined that there is a great deal more that can be studied and recorded on a Himalayas expedition than the classic Xenophonic "Thence we marked five parasangs."

J. E. F.

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Unclimbed New Zealand, by John Pascoe. 8vo., pp. 236, with numerous illustrations and maps. New York: The Macmillan Co., 1939. Price $5.50.

Exploratory mountaineering in New Zealand and elsewhere should have a big boost if this excellent book enjoys the circulation which it so well deserves. The author is one of a growing group of young New Zealanders who have rescued the sport from the doldrums where it had languished in that country, from early in the century up to the late twenties. The book itself is most attractively gotten

up, the style simple and direct, and each sentence worth while and interesting. The author has a facility for vividness without flowery expression. One who has visited and climbed in New Zealand feels that the illustrations are remarkably adequate and well chosen to give the reader the correct picture of the country so well drawn by the text. Excellent maps with the parties' routes shown make it easy to follow the narrative.

There is a foreword by H. E. L. Porter who in the post-war decade did more than any one else to set the example of a high standard of performance to local guides as well as amateur climbers and aspirants. The experiences of the author and his companions are skillfully woven into episodes of the life and history of earlier days in the central mountain groups of the South Island. One feels that these climbers in their wanderings have come close to the true spirit of pioneer New Zealand.

The young climbers seem mostly to be people of moderate means whose outings are limited to week-ends or at best to one or two weeks' holiday. The Canterbury and Westland Ranges, chief field of activity, lie W. of Christchurch and N. of the Mt. Cooke district. A favorite week-end is: to leave work early Saturday afternoon, drive several hours, have supper, begin climbing almost at once and often right through the night, arrive at the objective (most frequently a virgin peak) Sunday forenoon, descend in the afternoon, and return home by the wee small hours of Monday morning in time for a few hours' sleep before resuming work. Then there are one- or two-week trips in which the most notable exceptions to the daily program are an occasional day off, either through sheer exhaustion or impossible weather, although the latter is allowed to interfere less often than one might expect. Offsetting this apparent *tour de force* attitude there is throughout a spirit of appreciation and enjoyment and a fair sprinkling of humor. Snatches of verse come here and there.

Perhaps more than anywhere outside of the Alps mountaineering in New Zealand is becoming a national sport. Nearly all climbing is done guideless. Snow and ice work predominates, although there is an occasional rock climb which European climbers have rated six, seven being "the degree of a climb which was judged impossible, until someone did it without being killed." Bush-whacking becomes an art. Huts, if any, are primitive, and

tents are generally carried. Special techniques are developed for crossing streams with rope, and so on.

There is a bibliography, but no index, though one is shown in the contents. One should include this book in any short list of books on the mountains desirable to own. It is, whether or not so intended, good propaganda for New Zealand.

H. S. H., Jr.

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The Throne of the Gods, by Arnold Heim and August Gannser. Translated by Eden and Cedar Paul. 8 vo.; xxv + pp. 233, with 220 photographic illustrations and 18 sketches in the text. New York; The Macmillan Co., 1939. Price $5.00.

Heim and Gansser, two Swiss geologists have described their wanderings in Nepal, Tibet and northern India. They climbed two 20,000-ft. peaks and crossed nineteen passes over 16,000 ft., but did little difficult mountaineering. The book recounts their experiences and discoveries, the lives of men, animals and plants, not only among the crags and glaciers of the high mountains, but also on the way thither, avoiding the play of fancy by keeping strictly to data furnished by careful diaries.

Throne of the Gods is undoubtedly an unembroidered account, but the book is involved, humorless, and lacks continuity. Dramatic moments receive little more attention than unimportant details of daily routine. Good local color, as in the finding of a deserted Tibetan city, or the journey to Kailas, often needs further development. Probably the volume has suffered in translation. The pictures are often splendid, but one-fourth the number printed full-page size would be more effective.

The authors should be criticized for taking advantage of the Indian government and going through to the forbidden mountain of Kailas. Such actions penalize later expeditions. The authors, however, must be praised for their success in living on native food, and running a small, inexpensive scientific expedition. The appendices are valuable. Here one notes that October is recommended as the best month for climbing expeditions in the Himalayas. Heim and Gannser deserve credit for their important geologic discoveries, but their book lacks the success that a central purpose might have given it.

R. H. B.

Georg Jennerwein, der Wildschütz, by Georg Stöger-Ostin. 8vo., pp. 195. Munich: Gesellschaft Alpiner Bücherfreunde, 1939.

Der Weg zum Berg, by Alfred Gräber. 8vo., pp. 191. Same publisher.

Two new volumes maintain the excellent standard of publications issued by this energetic group of Munich booklovers. Stöger-Ostin has arranged a new edition of his interesting biography of Jennerwein, a famed and debonair poacher of Schliersee, who became almost legendary during his short lifetime. The story is handled with restraint and charm, the dialect precise, forming an authentic record of Bavarian peasant life in the 1880's.

Alfred Gräber, a well-known Swiss author, is somewhat less successful with a collection of eight short stories dealing with man's contact with mountains, the various phases of longing therefor, and the apparent triumph of this desire over all human relationships. The theme that to wander is more soul-satisfying than to have friends is wordily overemphasized, and some of it doesn't ring true.

J. M. T.

Achtung Gams, by Walter Majer-Maschée. A picture-book for hunters and mountaineers. Small 4to., pp. 91, with 84 illustrations from photos by the author. Berlin: J. Neumann, 1939.

Whatever evil befell humanity from the Austrian Anschluss, it was at least a good thing for the chamois, since it put the crest of the Limestone Alps north of the Inn under a unified game commission and thus reduced poaching on both sides of the old frontier. The author, from his hut in the Karwendel, has observed the chamois on some of the most famous preserves of Tyrol, and has produced a book which pictorially is one of the best on the life cycle of this attractive animal.

J. M. T.

Das Buch von der Alp, by Giuseppe Zoppi. 8vo., pp. 176, with illustrations from pen-drawings by Hans Tomamichel. Einsiedeln: Benziger and Co., 1939.

The author, now a professor at Zürich, was once a herd-boy on the alplands of Canton Ticino. He has written with great charm of his childhood experiences of thirty years ago, in a book of sharply-

drawn sketches of the mountain peasant, of the things that seem so bright and wonderful when one is nine years old. It is no small luck for a man who spends his later years with books in sedentary occupation, to have had a youth like his, in the clear air of a hidden valley, in company of strong men and their animals amid primitive surroundings. Zoppi writes of the Alps as Segantini painted them, his book loses nothing in translation from the original Italian, and is the best of its kind since the appearance of Javelle's recollections.

J. M. T.

Unbekannte Schweizer Landschaften aus dem xvii. Jahrhundert, by S. Stelling-Michaud. 4to., pp. 103, with 40 plates. Zürich: Niehans Verlag, 1937. Sw. Fr. 16.50.

The great Dutch masters, like Rembrandt, seldom traveled south of the Alps—there were enough Italian masterpieces in home museums. But the "little masters" were wanderers, and one of these, Jan Hackaert, went about in Switzerland during 1653-55. The usual route to Italy was up the Rhine to Basle, thence to Chur and Thusis, whence the Via Mala led through the Splügen and St. Bernardino passes to Lakes Como and Maggiore. This book is an attempted reconstruction of Hackaert's route, based upon his sketches and notebook, the precise drawings revealing a sympathetic perception of Alpine scenery far advanced beyond the inaccurate views of Merian, and forming the most trustworthy depiction of the roads through the eastern cantons of Switzerland as they appeared in the seventeenth century.

J. M. T.

The Alps in 1864, by A. W. Moore. 2 vols., 8vo., pp. 524, with illustrations. Oxford: Blackwell, 1938. Price 10 s.

Some of this material the writer has read at times, in the original volume of which these are a reprint. Assembled together, however, they form a readable travelogue of summers three-quarters of a century ago. It is hardly necessary to comment on the he-man vigor of those days—tackling the Dom right from the Monte Rosa Hotel in Zermatt, for instance. To those of us who received our first mountain training among the classic climbs of the Alps, these books are bound to be far more interesting than to those whose mountain education was achieved among the Rockies of our West

and have then visited the Alps to try only a few of the newer "trick" climbs. Those older classic climbs have a certain charm which never wears off, however often they are done. The illustrations in this book do rekindle the charm of these classic climbs for those who have once known them.

It is regrettable that, to such a full feeling of the past, there should be added any airplane views; for new, unknown country such as Alaska airplane views have no equal, but for peaks we have always seen pictured from below, somehow the different airplane perspective reduces their friendly features. For those who have fond recollections of the Alps, these two volumes, very inexpensive, will prove a pleasure.

J. E. F.

Mountain Records of the Sierra Nevada, compiled by Richard M. Leonard and the Committee of Mountain Records, Sierra Club. 1937, with supplement to 1939.

Climbs in the Cascade Mountains, Oregon and California, by Samuel F. Thomas and Charles B. Hardin. 1939.

In two impressive mimeographed manuscripts we have presented material which will be of great value when there is sufficient demand for formal climbers' guidebooks to the regions considered.

The Sierra compilation is a condensation of historical data from various sources, and contains no climbing directions. Hence it is a reference rather than a field book. The list is divided into major groups, separated by rivers and passes. Each group is then arranged alphabetically as to named peaks and by altitude as to unnamed summits. The historical data are listed chronologically with reference to the printed sources.

The second pamphlet provides the mountaineer with an introduction to the Cascade range of Oregon and California, the authors limiting themselves to routes which they have themselves traversed. The material is usefully prefaced by notes on equipment, climbing centers, guides, mountaineering organizations, roads, fire protection, times and elevations, and specially recommended trips.

VARIOUS NOTES

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Library Circulating Privileges

Circulating privileges in the Library are available to members who are non-residents of the vicinity of New York. All applications for loan of books must be addressed to the American Alpine Club, 140 East 46th Street, New York City, attention of Miss Helen I. Buck, Librarian.

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In view of the fact that the European war will probably lessen the opportunity of climbing in the Alps, Mr. Bradford Washburn has kindly offered to furnish at cost to any member of the American Alpine Club prints of the National Geographic Alaskan photographs, which would be useful to climbers contemplating expeditions in that territory. Nearly 4000 negatives are available, covering approaches to most of the big unclimbed Alaskan peaks. Apply to Mr. Washburn at New England Museum of Natural History, 234 Berkeley St., Boston, Mass.

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Wyoming Rockies

Teton Range

Weather and seasonal conditions were both good during 1939, and a large number of ascents (163) were reported to the Park Naturalist at Jenny Lake. All the major peaks except Buck Mountain were climbed at least twice, the Grand Teton retaining its popularity with sixty ascents by various routes. The following are noteworthy, three being by new routes:

Grand Teton.—1. New route on N. face, *via* a couloir left of the head of Teton Glacier, thence to the E. ridge. J. Hossack and G. McGowan.

2. Ascent of E. ridge, involving crossing of the first gendarme rather than a traverse to its right or left. N. Dyrenfurth, E. N. Ohl.

3. A fast round trip, from base to summit and return in 5 hours, 22 minutes. J. Hawkes, J. Holyoke.

Mt. Moran.—1. New route on N. ridge, from Moran Canyon to the lower summit. P. Petzoldt, W. Ringler.

2. New route on N. face of N. E. ridge to a point just below the lower summit. E. Clark and D. Grant.

Absaroka Range

A probable first ascent of Mt. Index in N. W. Park County was made on September 24th by G. Haas, J. Makowski, P. D. Smith, from a timberline camp on the N. W. side. An involved route led from the saddle connecting with Pilot Peak, and the final 150 ft. of the crumbling summit block was climbed by a chimney on the W. face. Descent was made by the same route: reasonably safe and the easiest that could be found.

PHIL D. SMITH.

♠

Wind River Range

In August last Mrs. Underhill and I made the following climbs in the Island Lake region of the Wind River Range, Wyoming Rockies. Camp was placed, first, about half a mile N. of Island Lake; then, at the head of the second Titcomb Lake; and finally, near the head of the highest lake.

Frémont Peak, S. face (first ascent). August 9th. The ordinary route utilizes a S. W. buttress, while the high S. E. ridge constitutes the main divide; midway between these projects a southerly spur. We started up a talus slope immediately E. of this spur. The slope issued from a large gully of broken rock, which was followed up to its head perhaps 500 ft. below the summit. This head, as the gully swung to the right, lay upon a ridge or rib forming the W. boundary of another and yet larger gully to the E., which dropped steeply from the summit and was filled both above and below with a bed of hard snow. Cutting across this couloir (75 ft.), we climbed the rocks, smooth and in places fairly difficult (owing largely to their unsoundness), of its E. border to their head upon the S. E. ridge, two gendarmes removed from the summit. We then traversed these gendarmes and their intervening snow cols to the summit itself, passing at one point a rope-sling left by Henderson's party of 1936, who descended this part of the S. E. ridge. Time, 6 hours from camp near Island Lake (as against 4 hours for the ordinary route, done a couple of days earlier).

Several variations of this route would probably be possible. Where the first gully heads, instead of crossing or following the second, one could *perhaps* climb the steep smooth slabs of the ridge to the left (W.) directly to the summit. Due to bad rock-climbing weather on the day of our trip (cold, wind, and the threat of snow, which actually began to fall just as we gained the summit and continued throughout the descent), we did not even attempt this route. One could undoubtedly start up the face at various points between the S. W. buttress and the S. spur, instead of to the E. of the latter, with the same possibilities at the top. However, none of these

routes is very attractive, as the lower and major part of each is merely a scramble over masses of broken rock. Very likely one could ascend the steep snow couloir throughout its entire length (we did not see its bottom), but the great labor of step-cutting, at least late in the season, would seem to make this strictly a matter of art for art's sake.

Titcomb Needles (second ascent). August 12th. There are four major pinnacles, flanked at each end, but especially on the S., by a large number of minor ones. Through the high central cluster the ridge, instead of running S. and N., bears at first N. E. then N. W., Point No. 2, counting from the S., being at the vertex of the right angle.

Leaving nailed boots at the foot of the peak, we gained the ridge from the E. by a prominent and easy gully leading to a sharp col just S. of Point No. 1. After climbing the minor pinnacle S. of this col we traversed around Point No. 1 on the E. and then climbed it from the N. and E. Passing Point No. 2, for the time being, on the W., we then climbed Points 3 and 4 by moving along and up the E. face. Returning, we climbed Point No. 2 from the S. W. and then descended from the ridge by a gully between Points 1 and 2, roping off part way down over a huge chockstone which is plainly visible from the floor of the valley. Left camp at head of second lake, 7 A.M.; foot of gully leading to ridge, 8.30; summit of minor pinnacle, 9.30; of Point No. 1, 10; of No. 3, 11; of No. 4, 11.15; of No. 2, 11.45; camp again, 1.30.

Despite the reputation these needles have enjoyed owing to their appearance from a distance, they proved to offer no problems of any sort, the climbing on them never being of greater difficulty than Grade II. The most that can be said for them is that they offer a very pleasant bit of exercise under mildly exposed conditions.

It looks as if a really good day's work might be found in the traverse of the entire set of needles, major and minor combined, from the rounded and easily accessible peak at the extreme S. to the col just S. of G-16 on the N. Another good climb which seems possible would be the ascent of the N. E. face directly to Points 3 and 4.

G-16 (second ascent). August 14th. Changed to sneakers and left baggage at foot of gully leading to col just S. of peak. Gaining this col, we started directly up the main S. ridge. The ridge, however, is presently blocked by an almost vertical step, which has the appearance from the valley of a huge fin. We turned this fin on the W., regaining the crest of the ridge only at the summit. The climbing here may be made as hard or as easy as one chooses, depending on how nearly one insists upon approaching the ridge; we lost much time in essaying routes which ran into fairly tight

places. The fin could also be passed on the E., by one who was looking for trouble; the slope of the rock ledges is there very unfavorable. Left camp, 6.55 A.M.; foot of peak, 9.30; col, 10; summit, 11.10.

From the summit we descended somewhat to the N. W. and then easily traversed the W. face, at the level of the S. col, to regain the latter and the gully of ascent (11.45). Essentially a very easy mountain, and less interesting than the Titcomb Needles.

Unnamed Peak, ca. 13,000 ft., at head of valley (first ascent). August 16th. The main divide crosses the head of the Titcomb gorge in an E.-W. direction. On this divide, somewhat W. of Dinwoody Pass at the precise head of the gorge, lies "The Sphinx," and between the pass and the Sphinx a set of high towers projects S. as a spur of the divide. In Henderson's excellent monograph, the authority for the region, these towers have somehow slipped by without a designation. However, they not only exist, but they constitute a very prominent object as seen from the Titcomb Lakes, and one bound to intrigue the rock climber.

Climbing up over a foundation ridge extending S. from the towers, we gained a small snowfield filling the basin W. of them and S. of the Sphinx. The steep W. wall of the towers is cut by several gullies; by the most southerly of the large ones, over rock disagreeably unstable at the foot but becoming firmer as it steepened near the top, we gained the ridge. Our point of emergence upon this was just S. of the main towers, of which there are four. After climbing the minor point to the S., we traversed the E. face to the gap just N. of the first high tower, which we then climbed by its N. ridge. From this gap the second tower looked highly unattractive, being very abrupt and its rock insecure. We therefore descended for a bit the gully leading down to the W., crossed the intervening rib, and reascended by the neighboring gully to the gap N. of the tower. (This latter gully was bedded with ice for 45 ft. at its top, and having neither nailed boots nor ice-axes with us, we viewed it with some misgiving. However, Mrs. Underhill led it by using a lie-back against the rocks along one side, and sliding up the ice.) After climbing the second tower from the N. we then repeated these tactics (with rope-off down the ice gully), coming up to the ridge a last time between the third and fourth towers. From here the latter was climbed easily enough, but the third tower, and the highest and steepest of the four, was for a step or two a really interesting proposition. One piton was used, and the descent required a rope-off; the sharp summit was very airy indeed.

While nowhere above Grade III in difficulty, these towers supplied a good climb, much superior to that of the Titcomb Needles. The course should, however, be taken from N. to S., reversing our route, when a straightforward traverse of all the summits could be made, with rope-downs over the sharp S. faces.

Unnamed Peak, ca. 13,100 ft., adjacent to the preceding (first ascent). August 16th. Immediately W. of Dinwoody Pass, and between it and the towers, lies another undesignated peak. Following the climb just described we crossed this peak in order to return home via Dinwoody Pass, and were somewhat surprised to find that it bore no cairn. It is, however, of no account, having only a few feet of climbing at its summit, and dropping to the pass in a long talus slope.

What I believe will prove to be the finest rock climb in the entire district has never yet been reconnoitered or even referred to in print. Just S. of and parallel with Mt. Doublet, from the flank of which it rises like an outrigger, lies a set of high pinnacles. We[1] first noted these in 1929, when making a traverse of Doublet, and christened them at the time the "Vajolet Towers," from their strong resemblance to these famous Dolomite peaks. They are invisible from the Titcomb Lakes, being hidden by Mt. Helen, but stand out prominently, to the E., from the S. slope of Dinwoody Pass. What they would actually amount to no one can, of course, say without attaining their very foot, but from all the angles from which I have viewed them they appear very promising indeed. They would be approached from the head of the Titcomb Lakes, bearing N. E. up into the trough between themselves and Doublet.

ROBERT L. M. UNDERHILL.

COLORADO CLIMBING NOTES

The principal event last summer in Colorado Mountain Club activities, was the School of Mountaineering which the Club held in lieu of their usual summer outing. This school, held in the Rocky Mountain National Park, gave instruction in nature study, geology, and all branches of climbing on rocks and on snow and ice. To many members it was their introduction to the methods of serious climbing, and capable instructors were on hand to conduct the work. An average of sixty persons were introduced to safe rock and snow climbing, and were so enthusiastic about this kind of an outing that it is quite probable that another school of the kind will be held in another year or two.

[1] Henry S. Hall, K. A. Henderson, and the writer.

A tragic reminder of the need and worth of experienced and properly equipped climbing parties was shown in the death of Gerald Clarke on the E. face of Longs Peak, which occurred during the time of the mountain club school. Clarke and two companions were essaying a climb up the difficult "second chimney" on the face, when Clarke who was in the lead could find no anchorage or belay for his rope, until he had passed beyond the rope's length above his companions. Thereupon he decided to go on up alone and his friends descended. Upon reaching the base of the cliff, they heard him shout that he was stuck and could go neither up nor down. They thereupon started for help and four capable Mountain Club climbers came to the rescue. Meanwhile darkness and a rainstorm had come on, and the rescuing party were not able to reach Broadway Ledge, a couple of hundred feet above Clarke until after ten o'clock that night. As he seemed to be in no immediate danger and in a safe place to stay, the whole party waited through the night, which continued stormy, and with the first light of day started down to Clarke. They reached him and lowered him with ropes to the bottom of the cliff, where he shortly expired from exhaustion and exposure. It is another unfortunate incident the lesson of which is quote obvious.

♠

In July, six Coloradoans, consisting of Carl Melzer and his eleven-year-old son, Bob, Elwyn Arps, Joseph Buswell, Robert Graham, and the writer, made a three weeks' trip to the Pacific Coast to climb California's thirteen peaks above 14,000 ft. and Mt. Rainier. In the time available they found it possible to climb only ten of them, the four peaks of the Palisades Group being passed up for another time. Within a week of their return to Denver, the Melzers found opportunity to go back to climb the Palisades, and thus they are the first to complete the climb of all sixty-four peaks in continental United States above 14,000 ft. Arps and Blaurock still have those four to climb, when they too will have completed the list. The party brought back a fine kodachrome record both in stills and movies of their trip.

♠

Winter finds additional skiing facilities ready in the high mountains, west of Denver. At Berthoud Pass, the tow has been lengthened another 600 ft., and 12 miles further on at West Portal a long tow has been built to open up additional ski terrain. All during the fall, skiers and CCC boys have been busy cutting trails from the head of the tow to the valley, so that everything is now in shape for a good skiing season. The first snows have already come and the real season will start about December 1st and last into May. The altitude ranges from about 9000 to 12,000 ft. in that district.

Aspen, Colorado Springs, Gunnison and other skiing centers have also been busy getting ready for the winter activities.

CARL BLAUROCK.

♠

ROCKY MOUNTAINS OF CANADA

Lake Louise was named for Princess Louise, Duchess of Argyll, who died December 3rd, 1939, at the age of ninety-one. She was a daughter of Queen Victoria, her husband, the Marquis of Lorne, becoming Governor-General of Canada in 1878. The lake is shown unnamed on the map accompanying Dawson's 1887 *Report*, but the name Lake Louise appears for the first time on the privately printed (1894) map of S. E. S. Allen.

♠

COAST RANGE OF BRITISH COLUMBIA

Mt. Sir Robert (Borden), and the Seven Sisters. In 1923 I saw the Coast Range below a cloud ceiling of 6000 ft., from the car window, while going from Jasper to Prince Rupert on the Canadian National Railway. Later, Allen Carpé saw some of these peaks from the train in better weather.[1] In 1938 I came east from Prince Rupert and saw everything possible on a perfect day. There are countless peaks of 6000 to 8000 ft. with glaciers extending down to 4000 ft. or less, rising directly from the Skeena River which *enters* the range at less than 500 ft. above sea-level. The highest peaks visible from the railroad are the Seven Sisters (*ca.* 9100 ft.) near Cedarvale and Mt. Sir Robert (Borden), the former being visible for a distance of more than 70 miles along the line, and so shaped and situated as to be easily the outstanding sight W. of Mt. Robson.

Hans Fuhrer and I left Jasper on August 7th, 1939, intending to try the highest Sister or Sir Robert, whichever proved the higher. No information as to height was obtainable from government sources. From the conductor I learned that Dr. Neal M. Carter of the Dominion Fisheries Experimental Station at Prince Rupert had been up to look at these peaks the year before. From the station at Pacific I wired Carter, and received the reply that he intended to try the Seven Sisters only the next week. Accordingly, Hans and I went for Sir Robert. On the evening of the 9th an Indian salmon fisherman rowed us across the Skeena, here 400 ft. above the sea, and we camped on the S. bank. It took about 12 hours, starting at 4.30 A.M. the next day, to reach and climb the peak. Tree-line, which is at 4800 ft. here, we reached

[1] *A. A. J.*, i, 425.

in three hours. For hours we followed a broad ridge up and down, losing 1500 ft. in one place. Easy rock, snow-covered glacier, and more rock scrambling brought us unroped to the summit, a distance of perhaps fifteen miles, involving about 10,000 ft. uphill. My aneroid showed 7850 ft. and checked back to Pacific, on the return, within 50 ft. The Seven Sisters, twelve or fifteen miles to the N. E., whose ice-mantled S. face had been visible from lower down, were hidden by clouds, but all else was clear. Howson Peak (*ca.* 9000 ft.) stood out 25 miles to the S. W. There appeared to be no peaks over 10,000 ft. in any direction for perhaps 100 miles.

On the return, goats were seen and plenty of fresh evidences of bears. Stopping in a sheltered nook from 8.30 P.M. to 4 A.M., we returned to the Skeena by 10 in the morning, and soon attracted our Indian on the N. bank by yodeling.

Dr. and Mrs. Carter, with Mr. and Mrs. W. E. Martin from Vancouver, reached 8275 ft. on the highest Sister on August 26th. Had weather favored they would probably have been successful, and Dr. Carter hopes to return in 1940. The Seven Sisters resemble the Ten Peaks near Lake Louise, from the N., where they rise 8700 ft. above the railroad, just across the Skeena. They are visible from Hazelton.

H. S. HALL, JR.

GUATEMALA

We climbed two volcanoes, *Tajumulco* (13,810 ft.) and *Picaya* (9000 ft.), the latter semi-active, both easy climbs. One rides a mule to within a few hundred feet of the top of each and walks the rest of the way. Tajumulco is the highest mountain in Central America. The climb is a beautiful trip through park-like uplands and we thought we could see both oceans from the top, although the Atlantic was rather uncertain. In climbing Tajumulco, we left San Marcos (7600 ft.) at 3 A.M. by motor, left San Sebastian (8500 ft.) at 4.30 on horseback, left our horses at treeline (about 13,200 ft.) at 7.30, and arrived on top at 8.15. We spent half an hour there, stopped a few minutes to see some Mayan pictographs on the way down, and were back in San Marcos shortly after noon.

T. D. C.

HIMALAYAS

A Swiss expedition was active in the Himalayas this summer (1939). A small party consisting of André Roch and Ernst Huber with the guides Fritz Steuri and David Zogg made several noteworthy climbs in Garhwal and surveyed the mountains around

the Kosa and Rataban Glaciers. On July 5th, Roch, Zogg, and Steuri made the first ascent of Dunagiri (21,170 ft.). A month later, on August 7th, Huber, with two Sherpas, Nima and Muchulia, made the ascent of Rataban (20,100 ft.). Later in August the climbers effected the ascent of Ghori Parbat (22,027 ft.), profiting from a previous reconnaissance made by Huber and his party earlier in the summer. Early in September, while exploring the Badrinath Glacier, one of the advanced camps was destroyed by an avalanche and despite prompt rescue attempts, two native porters were killed. The expedition returned shortly afterward.

A small Polish expedition of the High Mountain Club of the Polish Tatra Society made the first party of that nationality in the Himalayas. The party consisting of A. Karpinski (leader), S. Bernadzikiewicz, Dr. J. Z. Bujak, and J. Klarner was also operating in Garhwal. Botanical and entomological aims were carried out and the party made a fine collection of butterflies and flowers. On July 2nd the first ascent was made on the E. peak of Nanda Devi, the objective of the expedition. On July 19th, Karpinski and Bernadzikiewicz, assisted by three porters, established a high camp above the Milam Glacier, the porters returning to the lower camp the same day. The following day the other two members of the party came up in support and found the campsite covered with a thick layer of ice and snow, the location having been swept by an avalanche during the night. They found no trace of the first two men although they searched for two days and discovered a few articles of equipment.

A small German party again was in the vicinity of Nanga Parbat. The object of this summer's trip was to reconnoitre the approaches to the mountain from the Diamirai Valley with the objective of using this line of attack if it were found feasible for an attempt on the summit next summer. The leader of the party, Peter Aufschaiter, planned to make an attempt on Rakaposhi afterwards if possible.

Another German party consisting of Ernst Grob, Herbert Paidar, and Ludwig Schmaderer was active in Sikim, where they effected the first ascent of Tent Peak. Although this climb was successful, the margin of safety was exceedingly slender. The party had first to climb Nepal Peak (*ca.* 22,600 ft.), descend to the gap beyond and thence reach the summit of Tent Peak (*ca.* 23,200 ft.). The party was favored with reasonably good weather, but when they returned to their advanced camp they had no food left and had to descend immediately to their base.

German Expedition in Sikkim. Grob, Paidar and Schmaderer ascended 4600 m. peaks from camp on Hidden Col on Nepal border, and climbed to within 150 m. of Lampo Peak (S. summit, 6900 m.).

Alps

Albert Smith took the part of *Tell* (a patriotic party) in a burlesque entitled William Tell; or, The Strike of the Cantons, performed by a company of amateurs (the Fielding Club) at the Royal Italian Opera (Lyceum), June 2nd, 1856. The scene is a village on the Lake of Lucerne, where the following occurs:

Tell. My name is Tell—*tel que je suis je suis.*
An old Swiss family known very well;
My sisters keep the Rigi Kulm Hotel:
My nieces sing the Ranz dess Vaches when call'd
Up to the *table d'hotes* at Grindelwald.
My nephews carve in wood, and make those things
Which every tourist back to England brings,
And gives as *souvenirs* to those relations
From whom he thinks he's any expectations.
My uncles are all guide—ne'er at a loss
To climb the Jungfrau or the Grimsel cross.

J. M. T.

Andes

A German party consisting of Dr. Kinzl (leader), Hans Schweizer, Karl Schmid, Siegfried Rohrer and Walter Brecht was active in the Cordillera Blanca of Peru this last summer. Schweizer, Schmid and Rohrer completed from the W. the ascent of Nevado Contrahierbas (6036 m.), which climb had been attempted by the 1932 expedition. These same three with Brecht afterwards made the first ascent of Palcaraju (6150 m.). Later Ranrapalca (6165 m.) was climbed.

A group from the Deutscher Ausflugsverein in Santiago spent Easter in the Colinas group in Chile and made the ascent of several peaks in that group about 4300 m.

In Ecuador Gottfried Hirtz and Wilfrid Kühn made the ascent of the volcano Iliniza (5305 m.).

German Expedition to Peru. Participants: Dr. Kinzl, leader; Hans Schweizer, Walter Brecht, Karl Schmid, Siegfried Rohrer, Heckler. Ascents were made of Nevado Contrahierbas (6036 m.), Palcaraju (6150 m.), Ranrapalca (6165 m.), Tokharaju (6100 m.), Pambaraju (6300 m.), Hualcan (6150 m.), Huascaran (N. peak, 6655 m.). At the end of the expedition, while doing mapping work in the Huancayo district of Central Peru, Schweizer and Rohrer, with Diener, a Swiss resident of Lima, were killed in an avalanche.

German-Italian Party in Ecuador. Participants: Wilfried Kühn, Piero Ghiglione, Formaggio, F. Hirtz. Ascents were made of Iliniza (5305 m.), Cayambe (5849 m.), Pailacajas (first ascents of peaks 5100 m. and 5070 m.), Chimborazo (6310 m.), the latter by a new route on the S. side. The party is reported to have gone on to Bolivia for further climbing.

Later advice states that Ghiglione, Kühn and Formaggio made the ascent of Cerro Altar on July 20th, and four days later climbed Chimborazo. In Bolivia, Ghiglione ascended Illimani on August 13th with a Dr. Fritz, by way of the S. W. ridge. On August 26th, Ghiglione and a German engineer named Prenn made the first ascent of Sajama (21,500 ft.), highest mountain in Bolivia, following the S. W. ridge.

K. A. H.

Highest Peaks in the Arctic and Antarctic

For some years Mt. Forel (11,100 ft.), climbed by a Swiss party in 1938, was the highest known point in Greenland. In 1930 the late Gino Watkins saw from the air a group of peaks in Lat. 69°, Long. 30°, about 100 miles S. of the head of Scoresby Sound. In 1933 the Danes, Knud Rasmussen and Lauge Koch, flew to these mountains and photographed them. Lindbergh also flew near them at the time. The British Trans-Greenland expedition in 1934, triangulated the same range, now officially designated as the Watkins Mountains by the Danish authorities, from a distance of 50 miles to the W. after their crossing of the icecap from the W. coast, and calculated the highest peak, which they called The Monarch but has since been officially named Gunnbjornsfjeld, at about 13,000 ft. However, in August, 1935, another British party including L. R. Wager and Longland of the 1933 Everest expedition, landed 20 miles E. of Kangerdlugssuak fjord and after a sledge journey 110 miles inland climbed this same peak without difficulty and found it to be about 12,200 ft. (the official Danish figure from air and ground surveys now being 3700 m. = 12,139 ft.). Both parties carried copies of the Danish air photographs, and the 1935 party carried also the resulting map. This peak is now the highest known not only in Greenland but in the entire Arctic.

There are several peaks on the Antarctic continent of about the same height, including the volcano Mt. Erebus (13,300 ft.), near the shore of McMurdo Sound in Ross Sea, ascended by Mawson and others of Shackleton's expedition in 1909; and Mt. Fridtjof Nansen (13,000 ft. +) at the edge of the polar plateau in Lat. 85°, Long. 168° W., approached to its base, but not ascended, by Gould's

party of the first Byrd expedition in 1929. The latest maps of the Antarctic do not confirm earlier reports of peaks almost 15,000 ft. high. Only a small portion of the Antarctic continent is yet explored.

H. S. H., Jr.

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Equipment

It has recently come to our attention that the new rubber-soled mountaineering boots developed by E. Castiglioni and V. Bramani in 1935 have been placed on the market in Italy. Instead of the usual smooth rubber sole, the bottom is formed into rough excrescences in the shape of the usual nails. Shoes with this type of sole are reported to hold better on dry rock, especially granite, than the commonly used crêpe rubber soles of sneakers, and do not slip on wet granite. They can be used on snow and ice, although steps must be cut on steep slopes. For combination snow and rock climbs it is thus possible to avoid the necessity of carrying *kletterschühe*.

At the moment of going to press we have received word of the death of our Honorary Member, Lord Tweedsmuir (John Buchan), Governor General of Canada. An In Memoriam notice will appear in the 1941 issue of the American Alpine Journal.

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Material for publication should reach the Editor not later than December 15.

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